

AN EMPIRICAL ANALYSIS ON THE USES AND EFFECTS OF MEDICAL DATABASE MANAGEMENT SYSTEM BY MEDICAL DOCTORS IN TAMIL NADU

R. Jayaseelan¹ and C. Pichandy²

¹Department of Visual Communication, VLB Janakiammal College of Arts and Science, India

²Department of Mass Communication and Journalism, PSG College of Arts and Science, India

Abstract

E-health system in India as well as in other countries is confronted with growing demand for medical treatment and services. The medical records must suitably have all of the medical history of the patients. Medical doctors should have proper records, since this can help doctors as well as patients in various situations. The present investigation attempts to unearth the usage and effects of Information and Communication Technology among medical doctors in the field of medicine to enhance their profession in Tamil Nadu, India. In this endeavor, the primary task of the researchers is to apply the appropriate technique to identify individuals, who will constitute the sample for the present study and also develop a reliable instrument to measure the perception of the respondents and the uses and effects of Information and Communication Technology in the field of medicine. The researcher is bestowed with the onerous task of identifying the right samples that are medical doctors and the right place where they work (government, private and own clinic) to collect reasonably representative data. This deals with the procedure adopted for developing the psychometric instrument (questionnaire), which has been used to elicit information on the uses and effects of information and communication technology by the medical doctors in the field of medicine. The results of the study reveal the major patterns of the usage of medical database management system. However, the stage also points out the grey areas, especially in the government sector, the need for proper implementation, diffusion and adoption of ICT.

Keywords:

ICT, Database Management System, EHR (Electronic Health Record), EMR (Electronic Medical Record), Health Management System, PHR (Patient Health Record), Hospital, Patients

1. INTRODUCTION

Information and Communication Technology (ICT) acts as spine of the world economy and it plays a most significant role in global development. The concept of global village by Marshall McLuhan [35] is becoming a reality with new media defining the way we look at the world. The emergence on news technology and its advancements have made everything into a cluster. According to Marcelle [31] Information and Communication Technology are versatile and mixed set of products, applications and services used for developing, distributing, processing and transforming information.

According to the [40], ICT is mentioned as: one of the advanced, restructure, and profoundly employed approaches, which is used for the development of various sectors. It gives way to merits numerous multifold like swift dissemination of information, delivers vast sources of information and it also proves to be very useful for the person who adopt it.

1.1 INFORMATION COMMUNICATION TECHNOLOGY IN THE FIELD OF MEDICINE

Innovations in, and the use of emerging information and communication technology (ICT) has rapidly amplified in all development contexts in healthcare. It is believed that the use of appropriate technologies can increase the quality of medical treatment and its reach will be striking [10]. Sanderson [28] stated that 'healthcare ICT innovation can only be more effective if design is deeply adopted and take in to regular practice. Constant improvement in information and communication technologies (ICT) has had a greater impact in the increasing use of these technologies in the practice of medicine and in the provision of medical care. This has led to new dimension towards technological implementation in the field of medicine and has a great influence on the society in general. Marie-Pierre Gagnon et al. [17] point out that technologies are involved in gathering, storing and sharing information technologically. Electronic medical records, which are used by medical doctors for the reference of patients' medical history; medical journals, that are read by doctors for updating their ICT knowledge; online appointment system, for the appointments of doctor appointments, are some good examples of ICT usage. ICT has the ability to improve the healthcare sector and to give a quality treatment for the patients.

1.2 INFORMATION COMMUNICATION TECHNOLOGY IN THE FIELD OF MEDICINE IN INDIA

The health Care sector in India has witnessed a massive growth in the past few years both quality wise and as well as capability wise. The cost of health care relatively is very low while compared to developed countries, and the quality of treatment is at international standards and has positioned India as a major destination for health care services.

Each and every action in health care (i.e., patient registration, medical consultations, medical diagnosis, therapy, drug prescriptions, etc.) is being mostly operated by ICT in gathering, storing, processing and sharing information electronically. Examples of ICTs are patients' medical database, online medical referral and cloud computing, medical websites for doctor appointments, or systems on the internet to give feedback to doctors, so they can improve the care they provide. ICTs have the potential to improve health care and the health of patients, remarks Marie-Pierre Gagnon et al. [17]

It helps in reducing time gap, avoid confusions in data and wrong information in hospitals. It also helps in accessing, sharing useful information with other medical doctors and patients. The rapid development of technologies in the health sector and health

education shows a major development and it has become an important tool for information dissemination and accumulation.

According to Pichandy and Jayaseelan [8] the level of adoption of information and communication technology prevails high among the medical doctors in recent times. Electronic Health Management System (EHMS) is also commonly used by the doctors for storing various details such as study materials, patient history, etc. The usage of information and communication technology among the medical doctors is on a rise for various reasons.

Healthcare as business has shown a massive growth in India with adoption of advanced and new technology to deliver superlative quality service to face the competition [13] in and around the country. Information and communication technology has taken a foremost shift in the field of health worldwide, and the developing nations such as India are not an exception. Thanuskodi [43] explored that information and communication technologies are evolving at a tremendous rate in India. It is very difficult to determine the size and distribution of medical professionals who have access to ICT.

This paradigmatic shift focuses on usage and effects of information and communication technologies by medical doctors in the field of medicine to enhance their profession. This shift in the approach to the study on the usage of information and communication technologies in the field of medicine by medical doctors is considered a meaningful approach and such a study on an empirical ground becomes a much needed one in a country like India.

In this task, the present investigation explores the uses and effects of information and communication technology by medical doctors to enhance their profession. It is precisely on this premise that the present study assumes importance and is being set to arrive at meaningful inferences and a conclusion.

The main objective of the study is to find out the usage and effect of database management system among medical doctors for their profession.

2. REVIEW OF LITERATURE

In recent years there is a tremendous change in adoption of information and communication technology worldwide and the rapid advancement in technology has changed the work style of people. The modern information and communications technology (ICT) are changing the way of doing business and dealing with the daily routine activities. As the use of ICT expands globally, there is need for further research into cultural aspects and implications of ICT. There is a smooth transition in adoption of e-health universally, particularly when it comes to medical practice. They have become as part and parcel of everyone life. The adoption of ICT in early times was irregular. But today the scenario is completely different and it is much higher while comparing with people working in other fields.

According to Olatokun and Adeboyejo [1] health departments play important roles in a nation's socioeconomic growth. ICTs are vital tools that help medical doctors to access and use relevant information which are needed for their profession. ICT usage can be highly effective when it satisfies the needs of health professionals.

It is a well-known fact that doctors play a very significant role in the field of medicine. Their role in adoption of information technology and its tools is very important and essential.

Ammenwerth, et al. [3] explain these information and communication technology tools' adoptions have numerous advantages like improving the clinical and administrative performance within a hospital to promote quality and safe care. The benefits of computers and laptops to medical care are widely accepted; however, medical doctors have started adopting and utilizing new media tools as a part of their practices.

Olasina and Popoola [37] examined that use of information technology supports in information processing, decision making and records keeping in the health sector and the level of adoption varies according to health professionals, especially the doctors.

Fiona Chew et al. [11] denotes that the information technology has enabled medical doctors to obtain and share increased amounts of health care information and to track and monitor diseases. In addition to this, the internet has allowed physicians worldwide to share, interact and to communicate with one another. Physicians increasingly use online databases to search for the latest information on clinical protocols in different medical specialties, for patient management, to consult with specialists and seek continuing medical education.

Information and Communication Technology has the ability to aid advanced treatment care at low expenses while abiding by the government norms [26]. The major advantage of the adoption of ICT is, it helps the medical administration by empowering medical doctors and medical workers to have immediate access to high-risk patients' information from anywhere at any time, which helps them to attend the patients and save them from hard time [9].

2.1 DATABASE MANAGEMENT SYSTEM IN THE FIELD OF MEDICINE

The amount of information processing in hospitals, especially in the larger ones, should not be underestimated. Haux et al. [41] espoused many advantages in adopting EHR like easy accessibility, there is no need for big place to store the data or need not to worry about maintaining the paper based data base were possible for more risk .

In another remarkable study by Haux et al. [42] it was noticed that the reality of information processing in health care environment for past several years has been seen a great change over from paper-based processing and storage to computer based processing and storage. This has the ability to help the doctors to trace the history of the patients very easily even though the patient visited the hospital long back.

Yaphe [2] highlights the fact that medical doctors obtained computers in many countries during 1980s and Shiri Assis-Hassid et al. [5] indicates about the penetration of computers in the field of healthcare has tremendously changed numerous things, in the past two decades, from documentation, administration, and billing to more complex dimensions of healthcare, such as: diagnosis, consultation, education, and treatment.

Computer as a tool has transformed information and data handling in all fields of endeavor. The health professionals have been tremendously elated by the information and communications technology (ICT) revolution especially in the areas of information access, storage, retrieval, analysis and dissemination.

Acceptance of computer has grown rapidly among medical professionals, according to Manhattan Research's "Taking the Pulse U.S. 2012" survey of 3,015 physicians in 25 specialties. The survey, conducted in the first three months of 2012, found that 62% of physicians have their own computers; there is a growth of 27% in 2011; by comparison, most surveys put electronic health record use by medical doctors at around 50%, and that has required federal incentive programs to help get adoption to that mark.

Majority of doctors use their desktop and laptop computers chiefly for accessing the electronic health record, Internet and email, according to the Sources & Interactions Study which was held on 2013. They found out that 87% of doctors use computers for accessing health record of the patients and researching general medical issues and related topics.

Asangansi et al. [4] in their study confirmed that the doctors use database system to maintain patients' history which helps them to retrieve information of a particular patient at the period of treatment for giving a proper treatment. With the help of advanced technology there is major change and improved quality in treatment.

Gregory M. Garrison et al. [18] noted that the information and communication technology and its skills play an important role in giving excellent treatment. Medical doctors always use most of their time in a productive way like assorting information and at that information tools play a major role. It helps them to store, correlate, and retrieve enormous amount of information in a quickly and accurately.

Asangansi et al. [4] determines that the health professions have been tremendously affected by the information and communications technology (ICT) revolution especially in the areas of information access, storage, retrieval, analysis and dissemination.

The central India almost all doctors are aware of computer and its use in medical science. A positive role on computer is that medical doctors feel that they are being benefited by computers for their own education and as a source of information. Computers are considered generally or highly beneficial as the majority of subjects use the computer for data storage and to search medical related literature. They feel that it provides to perform less desirable tasks such as order and data entry. Access to up-to-date information provided in the context of the display of clinical information is being one "carrot" for physicians who otherwise may be reluctant to use new computer systems.

Health management report [36] concluded that newly trained physicians are more and more comfortable in handling computers and it becomes more user-friendly. Developing strategies to computer use such as providing internet access points to essential point-of-care information will help attract and retain providers who will also be effective users of other clinical information technologies and this interest will help them in supporting and promoting information technology solutions to improve clinical practice. In particular, medical doctors are promoting and expanding the technology diffusion among other physicians often.

According to the researcher Rizwan [45] the results of the study denote that doctors in India are increasingly wary of computer and its use in medical science. 96% of doctors know about computer based database management and about 95%

participants accept that computer based database management is a better choice for information updating.

Vedel [6] opined that different user profiles drawn from the dynamics of implementation are linked to different sets of perceived drivers and barriers that evolve over time. Certain factors favour the decision of adopting Da Vinci early on: e.g. user skills and the system's expected ease of use and usefulness. Certain concerns hinder its adoption: e.g. perceived negative impact on the doctor-patient relationship. As computer is one of the most important gadgets in the informative world the ICTs also play the vital role in bridging the knowledge gap among the people.

The medical doctors obtained computers in many countries during 1980s. Doctors with special interests in research were able to study their lists with the help of database programs. With the help of small computer machines and practical software for medical record keeping made it possible for doctors to use computers in daily practice. HIMSS defines; "Electronic Health Record (EHR) as a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting".

Paul C. Tang et al. [39] explains that ERC includes information about patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports etc. This EHR automates and streamlines the clinician's workflow; it has the ability to generate a complete record of a clinical patient encounter, as well as supporting other care-related activities directly or indirectly via interface including evidence-based decision support, quality management, and outcomes reporting.

Electronic Medical Record [34] (EMR) is the electronic middleman which paves way for the users to access and retrieve patients' data, to review patients' medical history, and to facilitate the activation between patients and medical users. There are many advantages for using EMR [14] and its implementation benefits healthcare related organizations such as hospitals and clinics in reducing medical errors, facilitating access, supporting clinical decisions and others.

Johanna Viitanena et al. [24] in their study point out that today, hundreds of information and communication technology (ICT) systems are used in healthcare organizations to serve physicians and other professionals in their daily work. These systems cover a broad range of applications, from widely used electronic health records (EHR) to computerised physician order entry (CPOE) systems. Among other industries, healthcare has already profited extensively by the development of ICT.

Elmer (2011) denotes that EHR systems provide access to health records to health care professionals and administration. EHRs can be distinguished in many ways, such as the Electronic Medical Record (EMR) and Personal Health Record (PHR). An EMR contains information which is entered by a single hospital department, an entire hospital or parts thereof, or even information from multiple hospitals. Typically, only hospitals will add information to the EMR. A PHR, on the other hand, is controlled by the patient and contains information that is (at least partly) entered by the patient.

Viitanen, Hypponen et al. [24] indicate that today, more number of information and communication technology (ICT)

systems are being used in healthcare organisations to help physicians and other professionals in their daily work with patients. These systems cover a broad range of applications, from widely used electronic health records (EHR) and computerized physician order entry (CPOE) systems.

Researchers Sun Young Park et al. [32] identified that numerous medical hospitals are transforming from written documents to “Electronic Medical Records” (EMR) systems. The influence of information and communication technology systems on doctor work practices has drawn attention from both the medical informatics and the human-computer interaction (HCI) communities. The EMR system influences not only people’s behaviors at the individual level, but also the administration work practices conducted in medical hospitals.

ITU [22] explains the electronic health record (EHR) as generated by one or more encounters in any care delivery setting. This includes detailed information about the patient including the medical history which helps in restructuring the doctors’ work structure. It has the ability to generate a complete record of a patient and helps in evidence-based decision support.

According to CPSO [12] report the medical record is a powerful tool that allows the treating physician to track the patient’s medical history and identify problems or patterns that may help determine the course of health care. The primary purpose of the medical record is to enable physicians to provide quality health care to their patients. It is a living document that tells the story of the patient and facilitates each encounter they have with health professionals involved in their care. In addition to telling the patient’s story, complete and accurate medical records will meet all legal, regulatory and auditing requirements. Most importantly, however, they will contribute to comprehensive and high quality care for patients by optimizing the use of resources, improving efficiency and coordination in team-based and inter professional settings

W.R. Hersh [19], L. Wilcox et al. [29] assert that healthcare IT systems (HIT), such as Computerized Physicians Order Entry (CPOE) and Electronic Medical Records (EMR), can benefit medical practices in various ways, including providing easy access to and accurate documentation of patients’ records, reducing potential medical errors, standardizing practice, improving the quality of patient care and billing management.

P.J. Embi et al. [38] lament that, these benefits are often coupled with unintended consequences in the actual work practices, such as increased documentation time incompatibility with clinical workflow more interruptions in medical work and system-introduced errors in patients care.

McLean, Virginia [34] espoused that electronic clinical documentation systems enhance the value of EHRs by providing electronic capture of clinical notes; patient assessments; and clinical reports, such as medication administration records (MAR). Examples of clinical documentation that can be automated include: Physician, nurse, and other clinician notes, Flow sheets (vital signs, input and output, problem lists, MARs), discharge summaries, medical records abstracts, durable powers of attorney for healthcare decisions, Medical record/chart tracking, releases of information (including authorizations), staff credentialing/staff qualification and appointments documentation, Chart deficiency tracking ,utilization management for example, intravenous medication pumps

connected to the clinical information system provide automatic dosage verification and documentation for medication management.

Robert and Ida Sim [30] an EMR can provide the electronic infrastructure for eight types of clinical and administrative activities normally conducted in physician practices. Commercial EMR systems vary in their capabilities for each type of activity, while practices and physicians vary greatly in how extensively they use available EMR capabilities.

E.M. Rogers [44] most interviewees were EMR champions who had positive, “can-do” attitudes toward solving EMR-related problems and who were vital to getting other physicians to use EMRs. These physicians - innovation “early adopters” - were willing to bear initial financial and time costs to generate benefits. In contrast, no champion physicians tended to be less positive toward EMRs.

Embi et al. [38] there are some causes of medical errors and one of these is due to different physicians treating the same patient. Not all or only a few physicians can access to all the patient’s medical records. Some of them do not know anything about the history of their patients and these can have damaging consequences if the wrong drugs or treatments are given to these patients. Another important cause of medical errors is in prescriptions, as writing them on paper is not clear and is too difficult to read it. Thus, electronic prescription would greatly reduce the prescription errors.

Leitman [46] advocate’s medical errors could be reduced by the use of decision support tools that would check for drug interactions as well as dosage levels and allergies. EMR could receive alert reminders for preventative care treatments, testing, and alert about various treatment procedures, guidelines associated with the diagnosis. Moreover, electronic records improve record keeping, recording and documentation of medical examination. EMR usage in hospitals generally reduces cost, improves clarity of documentation, clinical decision support, and enables better communication of information about patient referred for consultation, potential availability of the record anywhere, anytime as well as increased storage capabilities for longer periods of time.

McDonald [33] denotes the EMR also enhances the patient provider communication. EMRs can remove the communication barrier between doctors and patients. EMR can help public health officials easily detect an outbreak of illness and determine what measures are needed to protect the community. Another advantage of using EMR is the patient privacy and security. Electronic files play a significant role in maintaining patient information and confidentiality, as unauthorized access can reveal history of drug abuse, venereal disease, or life-threatening illness.

Vedel [6] stated in the article that “We can make systems that help professionals do their work better: providing reminders, allowing free and fast communication, allowing fast access to patient information and so forth. On the other hand, we can also make systems that require meticulous data entry for the sake of “completeness”, or that help managers’ overview and control the work of professionals.”

3. THEORETICAL FRAMEWORK

The real motivation for applying TAM is to find the adoption of information and communication technology in the workplace. The main focus of the investigators was on the acceptance of ICT by medical doctors (medical database management system), such as Blumenthal and Glaser [7] findings that to providers information and communication technology possibly enable complete development in eminence and cost. Similar investigation evaluated the acceptance of ICTs, such as personal digital assistants [25], as well as radiological picture archiving and internet communication systems Duyck et al. [15], and mobile phone and telemedicine technology Hu [20].

Holden and Karsh [27] indicate that there is a need for similar studies on TAM's application within the field of medicines; including distinguishing to what extent PU is based on perceived gains in patient outcomes or productivity. With all the related reviews the researchers framed the research hypothesis for the study.

RH: There is a significant difference between various age, gender, occupation, education and experience groups of respondents on the usage and effects of database management system in the field of medicine.

4. RESEARCH QUESTION

R.Q.1: Is there any difference among medical doctors in the usage of database management system in terms of Age, Gender, Education, Occupation and Experience?

R.Q.2: Is there any effect of the age of the respondents on the uses and effects of database management system in the field of medicine?

R.Q.3: Is there any effect of the gender of the respondents on the uses and effects of database management system in the field of medicine?

R.Q.4: Is there any effect of the education qualification of the respondents on the uses and effects of database management system in the field of medicine?

R.Q.5: Is there any effect of the occupation of the respondents on the uses and effects of database management system in the field of medicine?

R.Q.6: Is there any effect of the experience of the respondents on the uses and effects of database management system in the field of medicine?

R.Q.7: Is there any difference between the doctors working in government, private and own clinic on the uses and effects of database management system in the field of medicine?

5. METHODOLOGY

The present investigation attempts to unearth the usage and effects of Information and Communication Technology among medical doctors in the field of medicine to enhance their profession in Tamil Nadu, India. In this endeavor, the primary task of the researchers is to apply the appropriate technique to identify individuals, who will constitute the sample for the present study and also develop a reliable instrument to measure the

perception of the respondents and the uses and effects of Information and Communication Technology in the field of medicine.

In this process, the researcher is bestowed with the onerous task of identifying the right samples that are medical doctors and the right place where they work (government, private and own clinic) to collect reasonably representative data. This deals with the procedure adopted for developing the psychometric instrument (questionnaire), which has been used to elicit information on the uses and effects of information and communication technology by the medical doctors in the field of medicine to enhance their profession.

6. RESEARCH DESIGN

The Researcher has adopted an 'Ex Post Facto' Factorial Research Design which is a non-experimental design widely explored in social science research, mostly relying on survey procedures. This method is not only scientific but a systematic empirical enquiry, where the independent variables explored are already present in a social context. This method is not only scientific but also a systematic empirical enquiry, where the independent variables explored is already present in a social context.

Further, it is of great interest to note that the ICT usage and effects in field of medicine by medical doctors in this study has already brought about some influence and the present investigation is attempting to infer the nature of influence on certain parameters which were stated earlier as dependent variables.

The Researcher considered the independent variables such as database management, internet and mobile phone, the demographic variables such as Gender, Age, Educational Qualification and Occupation. The dependent variables are usage and effects of all the independent variables (database management, internet and mobile phone).

7. SAMPLE CHARACTERISTICS

The sample characteristics of the 427 samples included in the study are presented below.

Table.1. Showing the Age and Gender of the Respondents

Age	Male	Female	Total
25-35	95	101	196
36-45	103	67	170
46 and Above	26	35	61
Total	224	203	427

In the Table.1, it is observed that a major chunk of the respondents ($n = 427$) belong to the age group of 25 to 35 years with 95 respondents being men and 101 respondents are women. Whereas, in the age group of 36 to 45 years, 103 of them are men and 67 are women. In the senior category of 46 and above years, 26 are men and 35 were women. The sample reflects the young

and vibrant age dynamics of the contemporary medical industry in terms of age, besides providing ample representation for others.

8. RESULTS

Table.2. The results of One-way Analysis of Variance (ANOVA) on usage of computer database management system in the field of medicine in terms of age, gender, occupation, education and experience of the respondents

Demographics	'F' Value	LS
Age	01.988	Ns
Gender	01.962	Ns
Education	04.120	Sig
Occupation	19.468	Sig
Experience	03.556	Sig

Table of Means		Usage of Database Management System		
		Mean	SD	No.
Education	UG	3.2710	.81800	123
	PG	3.5540	.87001	176
	Others	3.3464	.98248	128
Occupation	Government	3.2942	.81833	166
	Private	3.0701	.88383	175
	Own Clinic	3.0040	.89404	086
Experience	01 to 05 years	3.3275	.97689	144
	06 to 10 years	3.4402	.83153	092
	11 to 15 years	3.6130	.78564	115
	16 years and above	3.2237	.93117	076

8.1 EDUCATION AND DATABASE MANAGEMENT SYSTEM

The results of one way analysis of variance (ANOVA) presented in the Table.2 reveal that there is a significant difference in the education of the respondents on the usage of database management system ($F(2,424) = 4.120, p < .05$) in the field of medicine. Hence, it can be concluded that the hypothesis is tenable.

8.2 OCCUPATION AND DATABASE MANAGEMENT SYSTEM

The results of one way analysis of variance (ANOVA) presented in the table 2 reveal that there is a significant difference in the occupation of the respondents on the usage of database management system ($F(2,424) = 19.46, p < .05$) in the field of medicine. Hence, it can be concluded that the hypothesis is tenable.

The table of Means shows that occupation category, private (M-3.70) has more database usage followed by government (M-3.29) and own clinic (M-3.04) respectively. Hence, it can be inferred that among the respondents of various occupations there is a significant difference on the usage of database management system in the field of medicine.

8.3 EXPERIENCE AND DATABASE MANAGEMENT SYSTEM

The results of one way analysis of variance (ANOVA) presented in the table 2 reveal that there is a significant difference in the education of the respondents on the usage of database management system ($F(2,424) = 4.120, p < .05$) in the field of medicine. Hence, it can be concluded that the hypothesis is tenable.

The table of means (Table.2) shows that in the case of adoption of information and communication technology, based on performance expectancy, in the category of education, PG respondents (M-3.55) show inclination towards the usage of database management system in the field of medicine followed by others (M-3.34) and UG (M-3.27) respectively.

Table.3. The results of One-way Analysis of Variance (ANOVA) on effects of database management system in the field of medicine in terms of age, gender, occupation, education and experience of the respondent

Demographics	'F' Value	LS
Age	10.046	Sig
Gender	00.537	Ns
Education	00.919	Ns
Occupation	05.042	Sig
Experience	03.859	Sig

Table of Means		Effects of Database Management system		
		Mean	SD	No.
Age	25 to 35 years	3.8571	.58844	196
	36 to 45 years	3.9200	.52911	170
	46 years & Above	3.5180	.84093	061
Education	UG	3.2710	.81800	123
	PG	3.5540	.87001	176
	Others	3.3464	.98248	128
Experience	01 to 05 years	3.8583	.60988	144
	06 to 10 years	3.8587	.59709	092
	11 to 15 years	3.9217	.50797	115
	16 years and above	3.6237	.77698	076

8.4 AGE AND EFFECTS OF DATABASE MANAGEMENT SYSTEM

The results of one way analysis of variance (ANOVA) presented in the table3 reveal that there is a significant difference in the experience of the respondents on the effects of database management system ($F(2,424) = 10.046, p < .05$) in the field of medicine. Hence, it can be concluded that the hypothesis is tenable.

The table of means (table3) shows that in the case of effects, the age of 36-45 (M-3.92) shows inclination towards the effects of database management system in the field of medicine followed by the age group of 25-35 (M-3.85) and 46 and above (M-3.51) respectively.

8.5 OCCUPATION AND EFFECTS OF DATABASE MANAGEMENT SYSTEM

The results of one way analysis of variance (ANOVA) presented in the above Table.3 reveals that there is a significant difference of the occupation of the respondents at 5 % significance level on effects of database ($F(2,424) = 5.042, p < .05$) in their field of medicine. Hence, it can be concluded that the research hypothesis is tenable.

The Table of Means (Table.3) shows that occupation category of private (M-3.94) is having more level of usage and effects followed by government (M-3.76) and own clinic (M-3.73) respectively. Hence, it can be inferred that among the respondents of various occupations there is a significant difference on the usage and effects of database management system in the field of medicine.

8.6 EXPERIENCE AND EFFECTS OF DATABASE MANAGEMENT SYSTEM

The results of one way analysis of variance (ANOVA) presented in the table3 reveal that there is a significant difference in the experience of the respondents on the usage and effects of database management system ($F(3,423) = 3.859, p < .05$) in the field of medicine. Hence, it can be concluded that the hypothesis is tenable.

The table of means (Table.3) shows that in the case of effects of database management system, the experience of 11 to 15 years (M-3.92) shows greater inclination towards the usage and effects of database management system in the field of medicine followed by 06 to 10 years of experience (M-3.85) and 16 years and above (M-3.62) respectively.

9. DISCUSSION

Asangansi et al. [4] denote that computer database management are being used by doctors to manage patients' data, to maintain patients' records in hospitals and to search and retrieve pertinent information. In general, clinical practice has been tremendously improved by the technological interventions and a new and rapidly growing field of applications called health (or medical) informatics has emerged. The results of the study also give a positive prediction on the usage and effects of database management system according to respondents' age, gender, occupation, educational qualification and their experience.

Though there is difference in the usage and effects of ICT there is higher inclination towards usage and effects among the medical doctors.

For example the respondents in age group of 36 to 45 use the database management system mostly and the effect of the database management system is higher on those respondents and this proves that the usage of ICT in the field of medicine is in a development stage in India.

Majority of doctors use their desktop and laptop computers majorly for accessing the database management system. They found out that 87% of doctors who are in the young age use computers mostly. In an yet another health management report [36], it is indicated that the new trainee physicians are more and more comfortable in handling computers, computer database management system and it becomes more user-friendly for them.

In spite of such variations like difference in age, gender, educational qualification and occupational status, there seems to be acceptance amongst all these groups on the usage and effects of database management system. When it comes to the gender, the male respondents are dominant in the usage and effects of database management system. This denotes that women should be encouraged to use the database management system in the future.

Ikolo and Okiy [21] in their study conclude, although male and female medical doctors are able to use computer database management system, there is a gender difference in the number of hours they spend using computers, the software they use and the kind of problems they face.

According to the occupational status, doctors working in private hospitals use the database management system in an effective way while comparing with the medical doctors who are working in government hospitals, because of the ICT infrastructure which the government has. Researchers James Studnicki [23] Government health organizations require well-designed database management systems in order to make optimal use of the mounting supply of health-related data. Organizations rely on these systems to inform managerial decision making and improve operations in areas such as patient care, epidemiologic surveillance, health outcomes assessment, program and clinic administration, program evaluation and performance measurement, public health planning, and policy analysis.

There is a positive direction on the study towards education qualification, the respondents who are with degrees of post-graduation and above have higher influence towards the database management usage and effects. Medical doctors feel that they are being benefited by computer database management system as a source of information. Database management is considered generally or highly beneficial especially among the medical doctors who have studied above under graduation.

The present study observes that those respondents with 11 to 15 years of experience have more inclination towards usage and effects of database management system. This shows that higher the experience, higher is the level of usage. Health management report (2004) explores that medical doctors are promoting and expanding the technology diffusion among other physicians often when they start using it in frequent periods.

Johanna Viitanena et al. [24] induct that today, more number of information and communication technology (ICT) systems is being used in healthcare organizations to help physicians and

other professionals in their daily work with patients. These systems cover a broad range of applications, from widely used electronic health records (EHR) and computerized physician order entry (CPOE) systems. Even in this particular study the results denote that there is positive effect on the usage of database management system.

9.1 IMPLICATION ON DEVELOPMENT POLICIES

The findings of the study clearly establish the fact that especially the doctors working in private hospitals make the at most use of the information and communication technologies. Participation of the private sector has been of crucial importance in the establishment, investment and development of ICT when compared to other sectors. In the current economic situation the private sector are willing to play major role in the efforts to spread ICT technology.

But currently, most investors shy away from investing in rural areas due to unfavorable conditions such as low purchasing power and high investment costs in areas that lack or with erratic supply of electricity and shortage of telephone lines [16]. ICT revolution will continue to ignore and marginalize poor cities and its people. The profit motive in the private sector cannot work unless deliberate efforts are taken to create conducive environment for investing through the establishment of favorable government policies and infrastructure. There is, therefore, a need for the government to exercise strong commitment and political will to bring in favorable conditions for investment in the rural areas by encouraging the development of low cost access technologies that address the need of the rural majority.

10. CONCLUSION

The usage and effects of database management system prevails high among the male respondents who are in the age group of 36 to 45 years, working in private sectors with the education qualification of post-graduation and above and experience of 11 to 15 years. The empirical evidences are ably supported by theoretical notions such as the Technological Acceptance Model on the usage and effects of information and communication technology by medical doctors in the field of medicine. This study has drawn on the factors like: usage and effects of database management system, internet technology and mobile phone technology. The results of the study predict that, there is a development in the usage of ICT by medical doctors in the field of medicine but there is need for further growth, especially in government sectors and implementation of government health policies should reach higher degrees for further growth.

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