Original Article

ADOPTION OF NEW MEDIA TECHNOLOGY FOR HEALTH PROFESSION BY MEDICAL DOCTORS WITH SPECIAL REFERENCE TO SOCIAL MEDIA

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ABSTRACT

Objective: The main objective of the study is to identify which social media is being mostly used by the medical professionals as an informative platform and to enhance their profession in a better way. **Study design:** Researcher embarked upon adopting an 'Expost - Facto' - Research Design, a non-experimental research design, extensively explored in social-science research, mostly relying on survey procedures. **Method:** To answer the 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, experience and education as independent variables and usage of social media as a dependent variable and selected medical professionals as samples from the state of Tamil Nadu which is the southern part of India with various levels of experience. After removing all incomplete samples, the final tally of respondents included in the study is 312. **Results:** The results of t-test reveals there is no difference between male and female respondents in terms of sharing information. The results of ANOVA reveals: There is a significant difference in sharing information on social media, discussing clinical issues, giving medical advice, monitoring the patients' health and according to making friends there no significant difference with patients and Tukey HSD results revealed that there is no significant difference pair wise mean scores for all the networks regarding making patients' as friends. **Conclusion:** The overall results of the study reveals there is a significant usage in sharing information, discussing clinical issues, giving medical advice to patients and monitoring them in emergency or critical situation through social media.

Key words: E-Health, New Media, Information Communication Technology, Medical Professionals, Mobile Phones Applications, Internet

Introduction:

Social Media is a type of virtual communication that allows people to connect with each other. This concept arises from basic need of human beings to stay together in groups forming a community. Social media is the combined of online communications channels dedicated to community-based input, interaction, content-sharing and collaboration. In current scenario, social network has turn to bean important platform for sharing content.

It takes few minutes to create a social media account and get connected with many users across the world becomes more interesting because you can stay connected with old friends and family members. The list of ten most popular social networking sites based on their Alexa global traffic rank and traffic rank from Compete and Quant cast is shown in table below[4].

Fig- 1: Top 05 social networking sites in the world[4]

Rank	Sites	Estimated Unique Monthly visitors
1	Facebook	550,000,000
2	Twitter	95,800,000
3	Myspace	80,500,000
4	LinkedIn	50,000,000
5	Ning	42,000,000

In early years, the web served as a platform for read-only information that users retrieved passively. But now it has transcended its role as an information provider, and is facilitating interactive two-way information sharing. Further, the rate of online networking among global users has been constantly increasing.

In the healthcare industry, face-to-face interaction has traditionally been the primary medium for information exchange. Now such as the internet and social media websites have enabled medical doctors to reach their coworkers and patients in a virtual environment. With increasing numbers of physicians interacting online, social media has become popular topics of conversation in the medical doctors once a day to explore health information. 58% access social media to get high-quality information[8].

Wireless communication and availability of Wi-Fi enabled personal digital assistants (PDAs) have made the service anywhere at any circumstance. Hence the physicians, patients and hospitals are integrated in a social network without any limitation of physical location; this makes them to discuss important clinical issues through social media[2].

The virtual world makes the patients and doctors to be connected even outside the exam room. When there is more attention focused towards hospitals' efforts, which are often driven by marketing and have comparatively large resources, primary care and other private-practice doctors are building an online presence. In this scenario all our medical doctors soon will be on social network for us, but some physicians' say that will be basic criteria within a few years. More than 1,300 doctors have already registered with Twitter Doctors.net, a database of physicians who tweet. "These are powerful, tremendously influential tools," says [14].

Computer-generated hospitals offer services atmosphere to patients at home, office and during the travel also. It is tremendously useful when observation is required during post treatment condition or in critical situation[2].

Medical doctors are also use social networking to crowd source answers to clinical questions. For example, on Sermo, an online physician-only social networking community, credentials are verified during registration of new members and "physicians across all 50 states representing 68 doctors come to network, giving medical guidance, discuss clinical issues, and get expert advice whenever they need it[16].

Due to the development of technology there is a rapid and continues change in virtual media. People are well-known with social network sites like Face book, Twitter, Linked In, Google Circle and these sites have become enormously popular across millions of users. The access of social network has become progressively important in every industry – including healthcare. *Quantum* gathered data from more than 4,000 doctors and stated in September 2011 that 87 percent of medical doctors use social networks sites

for personal use and 67 percent use social media for professional purposes.

Medical doctors use social media professionally to find and share information on health, connecting with associates and trainees, publish their research, making friends, to be part in health promotion, for job search[1]. In addition, a growing minority use social media to talk with patients directly or in other ways that expand the medical care. The present investigation throws a light on the usage of social media in the field of medicine by medical doctors to enhance their profession[16].

The investigatortry to attempt to use the most widely applied Uses and Gratification theory. The study aims at evaluating the attitude of medical doctors towards the use of social media in the field of medicine to enhance their knowledge and for an easy work culture.

Uses and gratifications theory is pertinent to social media because of its origins in the communications literature. Social media is a communication instrument that makes people to be in contact and communicate with others, and perhaps billions, of individuals all over the world[26]. The basic premise of uses and gratifications theory is that individuals will use the media for various purposes and fulfills their needs and leads to ultimate gratifications[18].

The main objective of the study is:

- To identify which social media is being used by medical doctors to enhance their profession in general
- To identify which social media is being used as an informative platform
- To identify which social media is being used by doctors for monitoring, giving advice and are they making their patients as friends.

Review of Literature:

Social networks and its significance to health care have received greater attention in recent times. Surgeons are using online networks and social media highly. Nearly 90% of doctors' use minimum one social network site for personal use, and 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[26].

Throughout the past decade, social media has become a practical vehicle for the exchange of ideas and information, and the reach of sites, such as Face book, Twitter, and YouTube, has extended into the modern medical field[15].

Physicians' use social media professionally to find and share information on health, being in connect with colleagues and trainees, publish their research, promote their practice, or engage in health support. In addition, few numbers of medical doctors use social networks to interact directly with patients or in other ways that augment clinical care[17].

Doctors using blogs or social networking sites to share credible health information; social media can help physicians fulfill the professional obligation to share relevant information with patients, coworkers, and others in proper context[16].

Online media channels benefit doctors both as sources of information and as platforms for the giving information: Many physicians have turned to social media to help them keep up with new information they need to know to provide quality care. In a recent study it was found that more than 70 % of primary care doctors and oncologists use online media once a month at least to search or share health information[6].

According to supporting literature, researchers seek to determine usage of social media in their profession.

RQ 1: Do medical doctors use social media information sharing platform?

When using social media for clinical care, great care must be made to ensure that protected health information is safeguarded. Peer-to-peer healthcare is emerging as a source for patient information and support. In a 2011 study, 23% of people in USuse Internet with chronic medical conditions (hypertension, diabetes mellitus, or cancer) surfed online to find others with the same medical conditions compared with 15% of users without a chronic condition[25].

Dr. Pope's research noted that doctors and patients can effectively use the social forums to discuss the clinical issues and find support, while selecting the best options for care. Additionally, doctors can use social media for a number of positive aspects, but that clear, definable protocols should be set in place[23].

Social media-savvy practices have set-up closed social media platforms that allow for patients to be actively involved in their own care coordination, to track their clinical progress, and for greater access to their physicians[16].

With the extent of available literature on usage social media for discussing the clinical issues the following question was raised.

RQ 2: Do doctors use social media discussing clinical issues?

There is an increasing interest in assisted living technologies for the elderly based on ubiquitous computing. With the help remote monitoring systems, the high risk on healthcare can be condensed. The intention is that some of the routine services and checking processes, which conventionally are conducted at clinical sites, can potentially be delegated to individual remote monitoring systems within the home. This would reduce healthcare costs, improve patient care and improve a patient's quality of life[5].

There are many recent showing the popularity of online social media monitoring systems extended to the healthcare domain[5, 3, 19, and 20].

Social network platform such as Face book enables fast development while offering some levels of privacy and security[5]. Of course, the platform also presents an interface that is widely known and used, which is also a great advantage.

Patients can tap into various "health subcultures" on the micro logging and social networking sites like Face book, Twitter, Google Circle including weight-loss communities that can provide accountability, encouragement, and advice from health professionals[16].

Social media also has the added benefit as tools for communication in crisis situations. A recent online survey by the American Red Cross indicated that the U.S. public has high expectations about its ability to use social media in the event of a crisis. Of the 1,058 adult respondents, 70 percent stated they expected emergency responders to monitor social media sites to be able to send help where needed. Providers can also use social media to communicate their availability/readiness to give medical advice in a disaster situation and coordinate their efforts through the ARC or the Federal Emergency and Management Agency[11].

In general the history of this literature has attributed to the usage of social media for monitoring the patient and giving medical advice to them have provided more substantial elucidations. The following research questions have been raised.

RQ 3: Do medical doctors use social media for giving advice and monitoring the patient's health?

Physicians also make the deliberate decision to 'friend,' or connect, on social networks with their patients to engage patients and seem more approachable[20]. Relationships between doctors and patients that are not based around clinical care can

raise a number of significant ethical issues[22]. Because of the power imbalance that can exist in any doctor-patient relationship, it is important that a professional boundary exists to maintain trust and protect patients from the possibility of exploitation. It is possible, and in small groups likely, that physicians may have friends who are patients. In these circumstances, physicians and medicinal students should be aware of their limitations about maintaining the official relationship in the surgery or clinic. Some doctors and medical students report that current or former patients have sent them friend requests on Face book.

While most physicians not considering to have an informal relationship with a patient in social media, research opinions that only few physicians accept friends request from patients and that few medical practitioners would decide on an individual basis[22].

With the extent of available literature on usage social media to make patients as friends the following question was raised.

RQ 4: Do medical doctors make their patients as friends in social networks?

Research Methodology:

Researcher embarked upon adopting an 'Expost - Facto' - Research Design, a non-experimental research design, extensively explored in social-science research, mostly relying on survey procedures. In this study the researcher aims to investigate the usage of social media among the medical practitioners for their profession. Hence, the research questions are mooted in this study so as to understand how the medical practitioners use social media as tool in medical field and accordingly research questions were generated.

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, experience and education as independent variables and usage of social media as a dependent variable.

For the study the researchers selected medical professionals from the states of Tamil Nadu, Karnataka, Kerala and Andhra which is the southern parts of India with various levels of experience. With this, the researcher collected a total sample from 365 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 312.

Sample Characteristics

Table 1 reveals according to gender category 108 (67 male and 41 female) use Face book. 73 (30 male and 43 female) use Google plus, 83 (41 male and 42 female) use twitter and 48 (22 male and 26 female) use LinkedIn. According to the age group 108(104 in age group 25 to 35 and 04 respondents in age group 36 to 45) use Face book. 73(28 respondents in the age of 25 to 35 and 45 in the age group of 36 to 45) use Google plus, 83 (10 respondents in the age of 25 to 35, 69 respondents in the age of 36 to 45, 04 from 36 to 45) use twitter. 48 (09 respondents in the age of 36 to 45 and 39 respondents in the age of 46 and above) use LinkedIn.

Table-1: Social Media * Gender, Age, Experience, Education Cross tabulation

Social media	Gender			Age			
	Male	**Female**	**Total**	**25-35**	**36-45**	**46 & Above**	**Total**
Face book	67	41	108	104	04	00	108
Google plus	30	43	73	28	45	00	73
Twitter	41	42	83	10	69	04	83
Linked in	22	26	48	00	09	39	48
Total	**160**	**152**	**312**	**312**	**127**	**43**	**312**

	Experience in years				Education			
Social media	**Up to 5**	**6 to 10**	**11 & Above**	**Total**	**UG**	**PG**	**Others**	**Total**
Face book	48	30	30	108	60	38	10	108
Google plus	29	25	19	73	21	38	14	73
Twitter	10	37	36	83	12	44	27	83
Linked in	13	12	23	48	05	16	27	48
Total	**100**	**104**	**108**	**312**	**98**	**136**	**78**	**312**

In terms of experience 108 (48 up to 5 years, 30 respondents from 6 to 10 years and 30 of them 11 years and above) use Face book. 73 (29 respondents up to 5 years, 25 respondents from 6 to 10 years and 19 respondents from 11 years and above) use Google plus. 83(10 respondents up to 5 years, 37 respondents from 6 to 10 years and 36 respondents from 11 years and above) use twitter. 48 (13 respondents up to 5 years, 12 respondents from 6 to 10 years and 24 respondents from 11 years and above) use LinkedIn. When it comes to educational qualification 108(60 belongs to UG, 38 of them PG and 10 who studied above PG) use Face book. 73(21 belongs to UG, 38 of them PG and 14 who studied above PG) use Google plus. 83(12 belongs to UG, 44of them PG and 27 who studied above PG) use twitter and 48 (05 belongs to UG, 16of them PG and 27 who studied above PG) use LinkedIn.

Findings

Table-2 result of t-test reveals there is no significant difference between male and female respondents in terms of sharing information, discussing clinical issues, giving medical advice to patients, monitoring the patients' health and making friends with them.

Table - 2: Result of T Test gender vs. Dependent Variables

	Gender	N	Mean	Std. Deviation	Std. Error mean
Sharing informations	Male	160	3.57	1.136	0.090
	Female	152	3.31	1.262	0.102
Discuss the clinical issues	Male	160	2.69	1.229	0.097
	Female	152	2.66	1.271	0.103
Giving medical advice	Male	160	3.71	1.225	0.097
	Female	152	3.78	0.955	0.077
Monitoring the patients health	Male	160	3.01	1.274	0.101
	Female	152	2.76	1.275	0.103
Making friends with patients	Male	160	3.76	0.989	0.078
	Female	152	3.90	1.149	0.093

		T	DF	Sig. (2-Tailed)
Sharing informations	Equal variances assumed	1.911	310	.057
	Equal variances not assumed	1.906	302.66	.058
Discuss the clinical issues	Equal variances assumed	0.207	310	.836
	Equal variances not assumed	0.207	307.76	.836
Giving medical advice	Equal variances assumed	-0.564	310	.573
	Equal variances not assumed	-0.567	298.77	.571
Monitoring the patients health	Equal variances assumed	1.727	310	.085
	Equal variances not assumed	1.727	309.15	.085
Making friends with patients	Equal variances assumed	-1.197	310	.232
	Equal variances not assumed	-1.192	298.05	.234

As shown in Table 3 of ANOVA: F (3, 308) =6.7, p<.05. Thus there is a significant difference in sharing information on social media: F (3, 308) =3.19, p<.05. Thus there is a significant difference in discussing clinical issue son social media: F (3, 308) =11.08, p<.05. Thus there is a significant difference in giving medical advice to patients on social media: F (3, 308) =3.19, p<.05. Thus there is a significant difference in monitoring the patients' health on social media: and there is no significant difference in making friends on social media.

The post hoc comparisons test was conducted to evaluate pair wise differences among group means with the help of Tukey HSD test. The results of the test revealed that there is a significant difference pair wise mean scores of Face book, twitter and Google plus for sharing information, p<.05. The value of LinkedIn does not have significant difference from other three groups, p>.05.

The post hoc comparisons test was conducted to evaluate pair wise differences among group means with the help of Tukey HSD test. The results of the test revealed that there is a significant difference pair wise mean scores of Face book, LinkedIn and Google plus for discussing clinical issues, p<.05. The value of twitter does not have significant difference from other groups, p>.05.

Table - 3: Table of ANOVA

		Sum of squares	Df	Mean square	F value	Sig.
Sharing informations	Between groups	27.991	3	9.330	6.794	0.000
	Within groups	422.971	308	1.373		
	Total	**450.962**	**311**			
Discuss the clinical issues	Between groups	14.582	3	4.861	3.190	0.024
	Within groups	469.367	308	1.524		
	Total	483.949	311			
Giving medical advice	Between groups	36.738	3	12.246	11.085	0.000
	Within groups	340.259	308	1.105		
	Total	**376.997**	**311**			
Monitoring the patients health	Between groups	15.322	3	5.107	3.191	0.024
	Within groups	492.973	308	1.601		
	Total	**508.295**	**311**			
Making friends with patients	Between groups	8.747	3	2.916	2.581	0.054
	Within groups	347.907	308	1.130		
	Total	**356.654**	**311**			

The post hoc comparisons test was conducted to evaluate pair wise differences among group means with the help of Tukey HSD test. The results of the test revealed that there is a significant difference pair wise mean scores of Face book, twitter, LinkedIn and Google plus for giving medical advice, $p<.05$.

The post hoc comparisons test was conducted to evaluate pair wise differences among group means with the help of Tukey HSD test. The results of the test revealed that there is a significant difference pair wise mean scores of twitter for Monitoring patients' health, $p<.05$. The value of does not have significant difference from Face book, LinkedIn and Google plus, $p>.05$.

The post hoc comparisons test was conducted to evaluate pair wise differences among group means with the help of Tukey HSD test. The results of the test revealed that there is no significant difference pair wise mean scores for all the networks regarding making patients' as friends, $p>.05$.

Table- 4: TUKEY HSD

DP Variable	(I) Social Media	(J) Social Media	Mean Difference (I-J)	Std. Error	Sig.
Sharing informations	Facebook	Google plus	0.000	0.178	1.000
		Twitter	-0.561*	0.171	0.006
		Linked in	0.322	0.203	0.390
	Google plus	Facebook	0.000	0.178	1.000
		Twitter	-0.561*	0.188	0.016
		Linked in	0.322	0.218	0.453
	Twitter	Facebook	0.561*	0.171	0.006
		Google plus	0.561*	0.188	0.016
		Linked in	0.883*	0.212	0.000
	Linked in	Facebook	-0.322	0.203	0.390
		Google plus	-0.322	0.218	0.453
		Twitter	-0.883*	0.212	0.000
Discuss the clinical issues	Facebook	Google plus	-0.103	0.187	0.946
		Twitter	0.173	0.180	0.774
		Linked in	0.558*	0.214	0.047
	Google plus	Facebook	0.103	0.187	0.946
		Twitter	0.276	0.198	0.505
		Linked in	0.661*	0.229	0.022
	Twitter	Facebook	-0.173	0.180	0.774
		Google plus	-0.276	0.198	0.505
		Linked in	0.385	0.224	0.314
	Linked in	Face book	-0.558*	0.214	0.047
		Google plus	-0.661*	0.229	0.022
		Twitter	-0.385	0.224	0.314
Giving medical advice	Face book	Google plus	-0.042	0.159	0.994
		Twitter	0.222	0.153	0.473
		Linked in	.965*	0.182	0.000
	Google plus	Face book	.042	0.159	0.994
		Twitter	.263	0.169	0.402
		Linked in	1.007*	0.195	0.000
	Twitter	Face book	-0.222	0.153	0.473
		Google plus	-0.263	0.169	0.402
		Linked in	0.744*	0.191	0.001
	Linked in	Face book	-0.965*	0.182	0.000
		Google plus	-1.007*	0.195	0.000
		Twitter	-0.744*	0.191	0.001

Contd... Table-4

DP Variable	(I) Social Media	(J) Social Media	Mean Difference (I-J)	Std. Error	Sig.
Monitoring the patients health	Face book	Google plus	0.104	0.192	0.948
		Twitter	-0.231	0.185	0.596
		Linked in	0.468	0.219	0.146
	Google plus	Face book	-0.104	0.192	0.948
		Twitter	-0.335	0.203	0.353
		Linked in	0.364	0.235	0.411
	Twitter	Face book	0.231	0.185	0.596
		Google plus	0.335	0.203	0.353
		Linked in	0.698*	0.229	0.013
	Linked in	Face book	-0.468	0.219	0.146
		Google plus	-0.364	0.235	0.411
		Twitter	-0.698*	0.229	0.013
Making friends with patients	Face book	Google plus	-0.204	0.161	0.586
		Twitter	-0.119	0.155	0.868
		Linked in	0.317	0.184	0.315
	Google plus	Face book	0.204	0.161	0.586
		Twitter	0.084	0.171	0.960
		Linked in	0.521*	0.197	0.043
	Twitter	Face book	0.119	0.155	0.868
		Google plus	-0.084	0.171	0.960
		Linked in	0.436	0.193	0.109
	Linked in	Face book	-0.317	0.184	0.315
		Google plus	-0.521*	0.197	0.043
		Twitter	-0.436	0.193	0.109

*. The mean difference is significant at the 0.05 level.

Discussion and Conclusion:

The number of physicians using sites such as Face book and Twitter has grown so quickly[9]The results of t-test reveals there is no significant difference between male and female respondents in terms of sharing information, discussing clinical issues, giving medical advice to patients, monitoring the patients' health and making friends with them. It is denoted that the usage of social media is being used equally by both male and female doctors.

Throughout the past decade, social media has become a practical vehicle for the exchange of ideas and information, and the reach of sites, such as Face book, Twitter, and You Tube, has extended into the modern medical field[15]. The results of ANOVA reveals: $F(3, 308) = 6.7$, $p<.05$. There is a significant difference in sharing information on social media and medical professionals use Face book, twitter and Google plus for sharing information.

Physicians' use social media professionally to find and share information on health, being in connect with colleagues and trainees, publish their research, promote their practice, or engage in health support[17].

Dr. Pope's research noted that doctors and patients can effectively use the social forums to discuss the clinical issues and find support, while selecting the best options for care[23]. Additionally, doctors can use social media for a number of positive aspects, but that clear, definable protocols should be set in place the results of ANOVA reveals: F (3, 308) =3.19, p<.05. There is a significant difference in discussing clinical issues on social media and doctors use Face book, LinkedIn and Google plus most for this purpose. Social media-savvy practices have set-up closed social media platforms that allow for patients to be actively involved in their own care coordination, to track their clinical progress, and for greater access to their physicians[16].In addition, few numbers of medical doctors use social networks to interact directly with patients or in other ways that augment clinical care.

Patients can tap into various "health subcultures" on the microblogging and social networking sites like Face book, Twitter, Google Circle including weight-loss communities that can provide accountability, encouragement, and advice from health professionals[16]. The results of AOVA reveals F (3, 308) =11.08, p<.05 there is a significant difference in giving medical advice to patients on social media and medical physicians use Face book, twitter, LinkedIn and Google for giving medical advice to their patients. Social networking websites may be useful places for physicians to gather and share their experiences, as well as to giving advice on medicine and particular treatments.

The popularity of online social media monitoring systems extended to the healthcare domain[5, 3, 19, and 20]. The results of ANOVA reveals F (3, 308) =3.19, p<.05 there is a significant difference in monitoring the patients' health on social media and doctors use Twitter more for monitoring purpose when comparing with other social networks like Face book, LinkedIn and Google plus. Overall, the development and deployment of online social media platforms for use in remote health monitoring for medical use has great potential for future eHealth/ mHealth scenarios.

Research indicates that 35 percent of physicians have received friend requests from a patient or a member of their family, and 16 percent of practicing physicians have visited an online profile of a patient or patient's family member[13]. The result of ANOVA reveals that there is no significant difference in making friends on social media and even the Tukey HSD results revealed that there is no significant difference pair wise mean scores for all the networks regarding making patients' as friends. Doctors have different practices and views regarding whether or how to communicate appropriately with patients on the Internet, despite online and social media becoming an increasingly common feature of clinical practice[12]. Additional training would assist doctors in protecting their personal information online, integrating online communication in patient care, and guidance on the best approach in ethically difficult online situations.

The overall results of the study reveals there is a significant usage in sharing information, discussing clinical issues, giving medical advice to patients and monitoring them in emergency or critical situation through social media. Medical professionals use Face book, twitter and Google plus for sharing information mostly. They use Face book, LinkedIn and Google plus for discussing clinical issues, they use all the four major

social networks for medical advice used in the study and Twitter is being used by them for Monitoring patients' health, but doctors are not ready to make their patients as their friends in any of the social media because of work ethics.

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