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Research Article

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Factors Affecting user Acceptance of Telemedicine in Islamabad, Pakistan

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Abstract

The study aimed to study the factors that affect the user acceptance of telemedicine among general population in Islamabad, Pakistan.Simple random sampling was utilised in this cross-sectional study to collect relevant data from all areas of Islamabad. Between April and May, data were gathered utilising a structured questionnaire. The study framework was chosen based on the technology acceptance model. The theoretical concept was put to the test using linear logistic analysis.The study found age and education significant among demographic variables. Attitude, demand and PEOU were also found significant in the study while PE and residence had no significance. This study supports the use of TAM in Islamabad's uptake of telemedicine services. The findings indicate that user perceptions played a key role in telemedicine uptake. Since technological acceptance varies geographically, there is a good chance that the factors influencing the adoption of telemedicine technology will differ from the sample presented here.

Key Words

User Acceptance, Telemedicine, TAM model

Introduction

When participants are separated by a great distance, telemedicine is defined as the exchange of medical information over a long distance as well as the use of communications and electronic technologies to help and offer healthcare. Telemedicine allows for the transmission of image-based data, speech files, instructions to a surgical robot, and even little bits of patient information. Telemedicine used to be only focused on communication between medical specialists in different parts of the world. (McHaney et al., 2019)

Although the use of telemedicine has grown by leaps and bounds over the past decade, there are still several challenges with user acceptance of telemedicine that need to be addressed to make it more mainstream. These challenges include concerns about security, privacy, and health literacy as well as uncertainty on the part of providers about implementation of the technology in clinics and hospitals. These concerns can be addressed through training and education of

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patients, clinicians, and administrators on how to use telemedicine effectively and efficiently so that it becomes a valuable tool in medical care (Sood S & Mbarika V, 2007).

Understanding Telemedicine

Before telemedicine can change the health care landscape, providers will need to understand how it can help them deliver better care at lower costs. But there are still a number of barriers that may prevent physicians from adopting these programs. Understanding what those barriers are — and knowing how they can be addressed — is an important first step in making sure health providers embrace telemedicine instead of resist it. Below, we explore some of those challenges. We also offer recommendations for overcoming them. By addressing these obstacles now, you'll be on your way to delivering even better care at lower costs — with or without patients being in your office. And that's definitely something worth Sharing.

Remote Consultation and Medicine include reduced cost, savings in time and convenience as patients no longer need to travel to a doctor's office, thus avoiding congestion and traffic. This benefit is especially important for patients who are disabled or in remote areas.

Practical Barriers to Telemedicine

Practical barriers, such as high-speed Internet connectivity or low-quality video, are slowing down adoption. The lack of wide adoption is due in part to a lack of clarity on how to deliver remote medical services. Guidelines need to be established so that doctors feel more comfortable practicing medicine over long distances. Companies also have to make an effort to provide better training for doctors who want to do telemedicine work. However, despite these challenges, most patients like working with their physician using telemedicine, especially if it means they will be treated faster than if they had gone through other channels such as a hospital emergency room or urgent care clinic. Additionally, most doctors report feeling comfortable practicing medicine over long distances because they have access to high-quality video technology

Uptake Challenges in Telemedicine

Getting people to use telemedicine technology can be difficult. Medical costs have risen faster than incomes in recent years, which means that many people don't have coverage. Many health insurance plans require patients to cover more out-of-pocket costs now than they did just a few years ago, which may lead some to opt out of using telemedicine altogether.

Even if a person has a health plan with good coverage for remote medicine services, there are a few other challenges that will come up at some point or another. For example, low data speeds or spotty service could mean slow video or voice calls—not something you want when someone's very life is on the line. In addition, keeping track of all your credentials (like passwords) across multiple devices can be challenging. If you lose your phone or tablet and haven't saved all your passwords somewhere else, it might take days to get back into your account!And, finally, security is always an issue with new technologies.

People often worry about their personal information being compromised during remote interactions. It takes time for people to feel comfortable giving their medical records over to a computer screen rather than an actual human being sitting right in front of them. All these things add up to create significant adoption hurdles for those who are thinking about offering telemedicine services themselves.

User Acceptance hurdles in Telemedicine

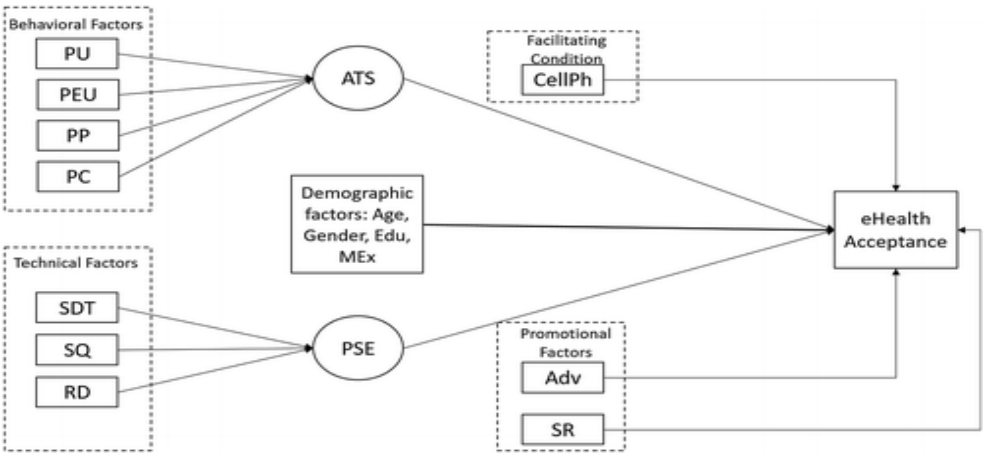
Many health care experts agree that remote medicine has enormous potential to improve patient outcomes by reducing costs, increasing access to medical expertise, eliminating many human errors in diagnostics, and freeing patients from long waits for appointments. Yet user acceptance remains a significant obstacle to wider use of telemedicine. The benefits are clear—but consumers often expect face-to-face consultations with doctors (Atlas of eHealth country profiles, 2015)

Studies have found that when offered video consultations as an alternative to in-person visits, some older adults aren't even aware they can see a doctor remotely. And according to a 2010 survey by Harris Interactive (now Equation Research), more than half of all adults said they would refuse to consult with their doctors using new technologies such as email or videoconferencing. Among those who were willing to try it, nearly one third said they would only do so if it was free. In addition, there is evidence that providers need training on how to deliver remote care effectively.

A study published in December 2011 found that doctors who had received training on how to conduct virtual examinations had higher ratings from patients than those who hadn't received training. Providers also need guidance on how best to work with colleagues who may be located hundreds of miles away—for example, what information should be shared electronically and how much supervision is needed during procedures. When physicians work together virtually, there must be consistent protocols for making decisions about treatment options and sharing information about tests results. (Aguilar et al., 2014)

Hypothesis and Research Framework

Several hypotheses have been established during the last three decades to explain the elements influencing people's acceptance of new technologies or technology-based services. The most well-known and often applied theories include the Technology Acceptance Model (TAM), TAM 2, Theory of Planned Behavior (TPB), Theory of Reasoned Action (TRA), Combined TAM and TPB, and the Unified Theory of Acceptance and Use of Technology (UTAUT). TAM was founded in 1989 by Fred Davis as a theory of information systems that explains how people comprehend, approach, use, accept, and use technology. (Davis, 1989)
The TAM, the most noteworthy model to explain end-user behaviour in health IT, is used in this study to achieve the research goal.



Methodology and Methods

Aim

The goal of this study was to investigate the variables that influence how well the general Islamabad, Pakistani public accepts telemedicine. The abundant data that resulted from this analysis were examined to determine what elements might prevent or, conversely, favour successful telemedicine.

Design

The study was descriptive, cross sectional and quantitative in nature. A questionnaire was developed and piloted. From the pilot study, Data were collected between April and May 2022 through a field survey conducted in Islamabad. Islamabad is the capital city of Pakistan and is located at the base of Margalla hills.

The general population of Islamabad was chosen as the study population for this research project. Simple random sampling was used to collect data all throughout Islamabad. This method gave every member of the population the same chance of being chosen, making it a suitable strategy when drawing conclusions from a sizable group. We randomly distributed 100 surveys, but after deleting blank fields and incomplete questionnaires, we could include 57 responses in our sample. The sample was created using a straightforward random sampling technique, which prevents bias by giving each potential participant an equal chance of being chosen.The majority of the study population (93%) consisted of women. More than a third of the participants were younger than 25 years of age (35.1%), whilst 38% were between the ages of 19-20 years of age. The study participants indicated that 80.7% lived in an urban setting and 19.3% in a rural area.

Assessment Tools

A structured questionnaire was constructed in English. Questions in the questionnaire are adopted from the literature review. UTAUT model and TAM models were consulted. Close ended questions and coded questions were used to extract the response of respondents. Overall questionnaire consisted of two sections. In the first section, questions related to demographics and socio-economic background were included. While the second section aimed to access the acceptance of telemedicine. To protect their right to privacy, respondents were told of the study's purpose and asked if they agreed to take part in the survey and allow us to publish their answers in our academic journals. The statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS). Logistic regression is used in the construction of our suggested model. Data were gathered using a standardised field survey questionnaire, and they were then analysed using logistic regression and other statistical tools.

Results

After the data was exported to SPSS Version 23, a descriptive analysis was done to compile the sociodemographic characteristics of the participants. Table 1 (Sample demographics, n = 57) lists the demographic characteristics of the respondents.

Table 1

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std.Deviation
Gender	57	.00	1.00	.1053	.30962

Age	57	18.00	35.00	21.1930	3.24279
Education	57	12.00	16.00	13.2456	.95020
Residence	57	.00	1.00	.8070	.39815
CP ownership	57	.00	1.00	.8596	.35044
Valid N (listwise)	57				

Age has the most standard deviation which is 3.242749. The maximum and minimum age, education, residence and cell phone ownership is given in the table above.

Correlation

In corelation we see the relationship between two variables weather it is dependent or independent. For that we use Pearson corelation which is also called simple correlation coefficient which is represented as ***r.*** The value 0.05 is considered as significant for correlation. In the table given below we have more than two variables which is not suitable for correlation.

Table 2

Correlations

		Knowledge	PU	PEOU	Attitude	Use
Knowledge	Pearson correlation	1	.855**	.842**	.943**	.905**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	57	57	57	57	57
PU	Pearson correlation	.855**	1	.736**	.786**	.804**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	57	57	57	57	57
PEOU	Pearson correlation	.842**	.736**	1	.801**	.775**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	57	57	57	57	57
Attitude	Pearson correlation	.943**	.804**	.801**	1	.821**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	57	57	57	57	57
Use	Pearson correlation	.905**	.804**	.775**	.821**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	57	57	57	57	57

Results of Hypothesis Testing

The hypothesis is tested using linear regression modelling. For this model, a significance level of 0.05 is used. The significance level of the models was compared to the p-value of the variables while making hypothesis testing decisions. The nature of the link between independent and dependent variables is indicated by the regression coefficient. Following table shows the hypothesis.

Table 3

Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig
1 (Constant)	-.789	1.055		-748	.458
Gender	.301	.196	.092	1.537	.131

Age	-.067	.031	-.206	-2.140	.037
Education	.207	.105	.187	1.969	.055
Residence	.153	.157	.060	.971	.336
Demand	2.927	.563	1.114	5.199	.000
PU	.145	.162	.118	.892	.377.
PEOU	.136	.073	.122	1.872	.067
Attitude	.926	.500	3.66	1.853	.070

The findings say that among demographic factors age and education have significant impact on user acceptance of telemedicine. While we did not find any significant influence of gender and residence on user acceptance. Our study showed that there is also a significant relationship between attitude of people towards telemedicine and its use. The demand for telemedicine has significant impact on its use. The people who demand for telemedicine are 1.114 times more likely to use telemedicine than who do not demand for it. While our study has showed there is also a significant relationship between PEOU and use of telemedicine. The variable of demand was also significant.

Discussion

In Islamabad, this study used an extension of TAM to determine end users' acceptance behaviour toward telemedicine. The theories in our investigation are supported by actual evidence. Most of our findings are consistent with prior studies that utilised TAM in distant healthcare systems, including e-health and m-health. Hoque, Bao, and Davis assert that PEOU significantly affect how users' attitudes (ATS) toward a certain system are shaped. According to Kim and Kayser et al., PSE has a positive effect on system adaptability.

The findings of the current study revealed that people with a lower degree of education were more likely to be uninformed of e-health, whereas those with a higher level of education were more interested in telehealth. Age is also a contributing factor in acceptance of telemedicine. Younger people are more likely to use telemedicine than the people of older age. The findings also suggest that PEOU is significant towards acceptance of telemedicine.

There are a few limitations in the research. We did this research on a population in a specific geographic area, which is Islamabad, Pakistan's capital. As a result, the findings may raise questions about their generalizability. As a result, more research may be done that covers a larger geographic area. Although we have added Attitude and Knowledge to the original TAM, a few other variables, such as users' trust and technological anxiety, might be included to create a more thorough picture of telemedicine acceptability by end-users. Further longitudinal studies, we feel, can be conducted to examine changes in the relational pattern and strength of input variables as telemedicine acceptability increases.

The findings of the study imply that telemedicine can be adopted at a higher level in Islamabad if essential components are taken into account to ensure acceptance and successful use. However, in order to promote adoption, decision-makers must evaluate other aspects of technology, such as its strengths and challenges.

Conclusion

Telehealth is a relatively recent occurrence in developing country rural populations. As a result, the total success of this endeavour is dependent not just on its IT design and implementation, but also on large-scale user approval. This study attempted to explain the elements that determine consumers' adoption of e-health and discovered that education is the most important

factor, followed by knowledge, attitude, and PU. Researchers in the future should try to analyse and collect both objective data and self-reported perceptions. These forms of data will help to answer outstanding questions about TAM constructs and their link to previous TAM studies.

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