ADOPTION AND USAGE INTENTION OF CONSUMERS TOWARDS TELEMEDICINE AMONG PEOPLE DURING PANDEMIC TIMES

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ABSTRACT

OBJECTIVE:

As COVID-19 engulfed the world, people are shifting to a new way of life with social distancing and self isolation, especially in developing countries. In such a scenario, online retailing has gone through a sea change with a new wave of increased demand and where the healthcare sector has also adjusted with the augmented transition from physical shops to e-commerce. The current study aims to assess the adoption and usage intention of consumers towards telemedicine among people during pandemic times.

METHOD:

The adoption of telemedicine by consumers depends upon some factors such as reliability, affordability, convenience, authenticity, offers and discount; which could enhance the intention to adopt and continual use by consumers. A modified version of 'Technology Acceptance Model' is incorporated in this study to validate the concept of adoption of telemedicine in cities of North India.

RESULTS:

The study has found the positive and significant relationship between the factors of adoption and the intention to adopt telemedicine. Also, the 'Effect of COVID-19' plays a moderating role between the different factors of adoption and the intention to adopt telemedicine.

CONCLUSION:

The adoption of telemedicine by people is significantly associated with different internal and external factors. The intention to adopt telemedicine is the construct that strongly influences the actual usage of telemedicine in developing countries. The scope of this study is restricted to the Northern region of India. A future study can be undertaken in relation to the global perspective of consumers.

KEYWORDS

COVID-19, healthcare, e-commerce, telemedicine.

INTRODUCTION

In the current pandemic situation, developing countries, like India, are struggling to improve the healthcare sector and are taking numerous initiatives to increase health care spending (as a fraction of its GDP). The government's aim is to fortify three major segments—preventive health, curative health and well-being—to boost the developing healthcare sector, is evident from its 137% expenditure increase for health and wellbeing in the Union Budget 2021[1]. Investors around the globe fear that the Coronavirus pandemic will destroy economic growth and the actions taken by governments may not be enough to stop the decline [2]. As lockdowns and the risk of spread of the virus kept most people indoors, consumers, shift towards online deliveries of nearly all necessities—groceries and other equipment for medical services.

Telemedicine is one of the verticals of e-commerce which has started gaining momentum and growing at a significant pace among the people [3]. The telemedicine market will further develop in the coming years with the help of renewed attention of the government and growth of e-commerce and faster adoption of the internet among users. With more people having approachability to the internet, its use in healthcare is becoming more prevalent. The scarcity of the availability of medical services in rural areas has also been overcome by telemedicine [4]. According to a collaboration survey by India's healthcare research organization (HRO) -SMSRC* and Purdue University in the United States, physicians and doctors in India have adopted to a large extent, in the usage of audio calls, WhatsApp and other social media applications in providing medical services [5].

Telemedicine can be understood as a combination of availability of medical services and medicines at the doorstep, with the help of an application or software. The online platform of purchasing medicines by the consumers can also be called e-pharmacy [8]. The expansion of e-pharmacies in recent times has been spurred by easy access to the internet, awareness of digital knowledge leads to digital transition of healthcare services and the urgency of medical services and medicines during the pandemic [9].

Technology adoption can be stated as "an organization's decision to acquire a technology and make it available to its members for supporting or enhancing their task performance" [12]. The term adoption refers to "the decision of potential users to make full use of an innovation as the best course of action available" [11]. Healthcare organizations have growing interest in obtaining and adopting telemedicine technology with an aim to increase or extend the healthcare services, especially during the pandemic times [6] [7].

Using an integrated technology acceptance model, the study examined the impact of factors of online shopping on intending to adopt telemedicine and its influence on the consumer's actual usage. The moderating role of 'Effect of COVID-19' on the relation between different factors of adoption and the intention to adopt telemedicine, is also assessed in the current study.

LITERATURE REVIEW AND FORMULATION OF HYPOTHESIS

Rogers' Diffusion of Innovation theory (1995) delivers a suitable framework to comprehend the adoption of telemedicine [21]. Telemedicine corresponds to the definition of innovation, which is described as an idea, practice or object which the adoption unit considers novel. Although one might argue that the usage of the telephone in the early 1900s launched telemedicine. In order to provide the extended medical services in remote areas the private hospitals of India started telemedicine services in 2000. Later in 2005, a number of telemedicine projects were set up by the health ministry of India with SAARC (The South Asian Association of Regional Cooperation) regional nation groups [48]. The urgency of utilization of telemedicine for drugs and other medical services has been created during lockdown due to pandemic situations all across the world [20]. In the rural areas of developing countries like India, availing the services of telemedicine prove to be gaining interest among the people due to less cost and greater speed [16].

CONCEPTUAL FRAMEWORK

The conceptual model for the current study is based upon internal and external factors. External factors refer to the environment surrounding the system as well as the system itself, while internal factors refer to user behavior and motivation [61]. The internal factors taken in the study are convenience, affordability, and hedonic motivation and the external factors are reliability, social influence, authenticity, offers/discount. Health organizations are benefiting from the increase in patient convenience through telemedicine that leads to satisfaction of patients

[15] [17]. Telemedicine can play a role in the reduction of health care costs for the patient. As per the theory of affordability, if the adoption of a new technology is economically affordable for the people, they would accept it and thus transition from potential users to the actual usage [14]. In line with motivation theory, hedonic motivation is pivotal in influencing technology adoption among users, focused on seeking information relative to the usefulness of the product or service with respect to the technology or the product [17]. If the potential user of technology-based service innovations perceives that the new technology is unreliable and believes that errors may occur, they are not likely to embrace it [19]. Furthermore, in developing countries where people give importance to others' opinion, especially the people belonging to their society, regarding the usage of new technology and develop intention to adopt the technology [19]. Moreover, with the use of telemedicine enable the users to get authenticate information in real time, which guarantee to provide secure and trustworthy medical services [13]. In order to reinforce the intention amongst people, many online telemedicine vendors provide offers and discounts on their online products and use other promotional strategies such as cash back and free delivery. [10]. Based on a literature review and previously published research work, the present research has used actual usage of telemedicine as dependent variable and intentions to adopt telemedicine as a predictor variable of actual usage [2]. Intention to adopt telemedicine further acts a a predictor for examining the actual usage of telemedicine. Actual usage has examined the usage behavior of the respondent towards using telemedicine.

H1: There is a significant impact of reliability on intention to adopt telemedicine.

H2: There is a significant impact of convenience on intention to adopt telemedicine.

H3: There is a significant impact of affordability on intention to adopt telemedicine.

H4: There is a significant impact of SI on intention to adopt telemedicine.

H5: There is a significant impact of the HM on intention to adopt telemedicine.

H6: There is a significant impact of authenticity on intention to adopt telemedicine.

H7: There is a significant impact of offers/discounts on intention to adopt telemedicine.

H8: There is a significant impact of intention to adopt telemedicine and actual usage

MODERATING ROLE OF COVID-19

It is stated that telemedicine proposes interactive solutions and helps in restructuring the healthcare by offering various benefits related to cost and time [26]. The present global COVID-19 pandemic offers a new dimension to the literature on telemedicine and its applications. Following the emergence of COVID-19, telemedicine has been quickly and widely adopted [27].

H9: Effect of COVID moderates the relation among the factors affecting the adoption of telemedicine and intention to adopt telemedicine by people.

FIGURE 1. RESEARCH MODEL
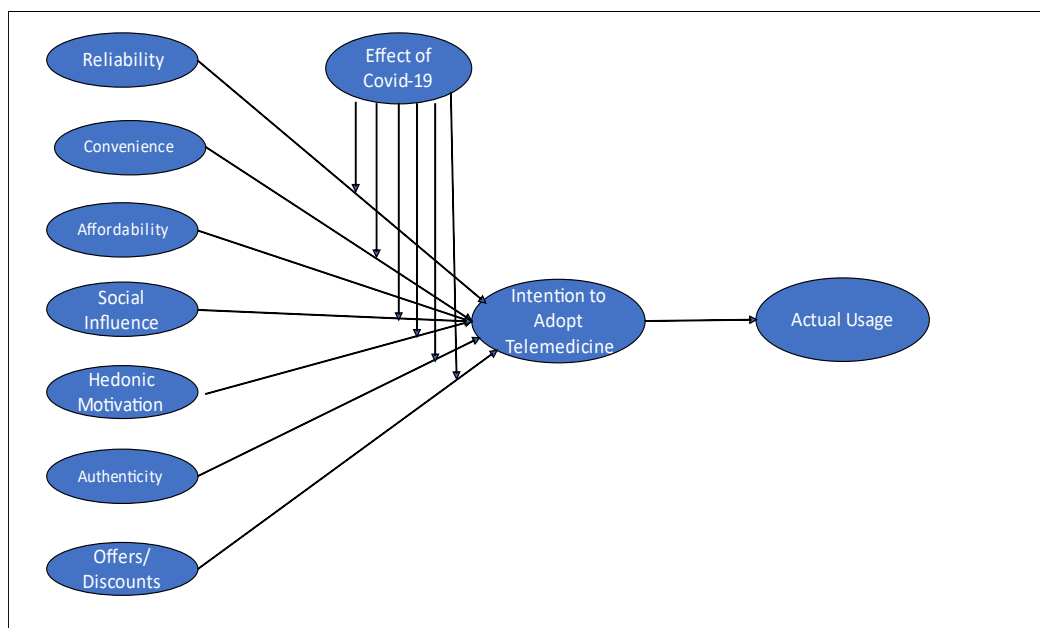
METHOD

In this study, an integrated conceptual model has been developed, using variables from the available theories of TAM and past studies of e-pharmacy adoption, to empirically authenticate the data for usage and intention to adopt telemedicine and its impact on actual usage of online mode of buying the medicines and other medical services (shown in Figure 1).

The relationships hypothesized in the framework are tested using SEM, to validate the measurement and structural model, through a survey study that has included customers of telemedicine in the smart cities of India. The random purposive sampling technique is incorporated in data collection, with a purposefully targeted population. The sample size for conducting the survey taken in the present research are 450 respondents (adequate sample size for structural equation modeling, on the basis of effect size on G* power, [18]), selected from the Northern region of India. A structured questionnaire is used both in online and offline modes, as the data collection tool to be used is to serve the purpose and objectives of the study.

DATA ANALYSIS AND INTERPRETATION

SAMPLE DEMOGRAPHICS

This section discusses the findings of the study. The demographic details of the participants of the survey are presented in Table 1

The total number of the respondents in Table 1 328. In Table 1 it is seen that 51.8% of participants are male and 48.2% are female. The sample consists of 42.4% participants in the age group 20-35 years, followed by the participants in the age group 35-50 years (31.1%) and remaining 26.5% are in the age group of more than 50 years respectively. Table 1 also depicts that 55.5% of the participants have an e-shopping experience of less than 2 years and 33.2% are having an experience of 2-5 years. For 11.3% of the participants have an online shopping experience of above 5 years respectively.

RELIABILITY AND VALIDITY ANALYSIS:

The measurement model is examined for internal consistency reliability [29] and the presence of necessary convergent and discriminant validity in the scale. The results of these statistical methods are reported and discussed below. In order to validate construct validity and reliability before analysing the interrelationship of the constructs in the structural model, the PLS algorithm is applied to the proposed model [25]. The final measurement model indicates the diverse variables affecting the intention to adopt the telemedicine by the consumers is shown in figure 1.

TABLE 1. DEMOGRAPHIC PROFILE OF THE PARTICIPANTS

Demographics	Sub categories	Frequency (Percentage)
Gender	Female	158 (48.2%)
	Male	170 (51.8%)
Age group	Age between 20-35	139 (42.4%)
	35-50	102 (31.1%)
	Above 50	87 (26.5%)
E-shopping experience	Less than 2 years	182 (55.5%)
	Between 2-5 years	109 (33.2%)
	Above 5 years	37 (11.3%)

TABLE 2: RELIABILITY, CONVERGENT VALIDITY AND DISCRIMINANT VALIDITY

Construct	Indicator Variables	Standard Factor Loading	Cronbach Alpha	Composite Reliability	AVE
Affordability	AF1	0.791	0.868	0.91	0.717
	AF2	0.834			
	AF3	0.863			
	AF4	0.896			
Authenticity	AN1	0.912	0.899	0.937	0.832
	AN2	0.918			
	AN3	0.906			
Intention to Adopt Telemedicine	AT1	0.935	0.818	0.894	0.741
	AT2	0.917			
	AT3	0.713			
Convenience	CO1	0.893	0.869	0.919	0.792
	CO2	0.92			
	CO3	0.856			
Hedonic Motivation	HM1	0.716	0.85	0.9	0.693
	HM2	0.878			
	HM3	0.864			
	HM4	0.862			
Actual Usage	IR1	0.847	0.723	0.844	0.644
	IR2	0.728			
	IR3	0.827			
Offers/ Discounts	OD1	0.909	0.893	0.933	0.823
	OD2	0.89			
	OD3	0.923			
Reliability	RL1	0.764	0.869	0.911	0.72
	RL2	0.901			
	RL3	0.849			
	RL4	0.874			
Social Influence	SI1	0.862	0.846	0.906	0.763
	SI2	0.875			
	SI3	0.883			

Authors' Calculation

The internal consistency reliability of the distinct variables taken in the survey is assessed with the help of Cronbach alpha, which are more than 0.7 and which shows (Table 2) a substantial degree of reliability [30]. It can be concluded that the composite reliability each construct in the model is above 0.70 [23], demonstrating that all constructs representing the intention to adopt telemedicine, in the measurement model have good reliability. Convergent validity is also measured by standardized construct loadings [24]. The construct loading of all observed variables in table 2 are found in the range from 0.716 to 0.935, which shows the adequacy of variables and significantly representing their constructs.

TABLE 3: CORRELATION MATRIX AND ROOTS OF AVE'S

	AU	AF	AT	CON	HM	OD	REL	SI
AU	**0.80**							
AF	0.51	**0.85**						
AT	0.34	0.18	**0.91**					
CON	0.38	0.33	0.42	**0.89**				
HM	0.53	0.31	0.28	0.31	**0.83**			
OD	0.40	0.38	0.16	0.19	0.31	**0.91**		
REL	0.54	0.26	0.26	0.28	0.79	0.29	**0.85**	
SI	0.23	0.07	0.2	0.17	0.26	0.11	0.2	**0.87**

*Diagonal in bold represents the square root of AVE from observed variable
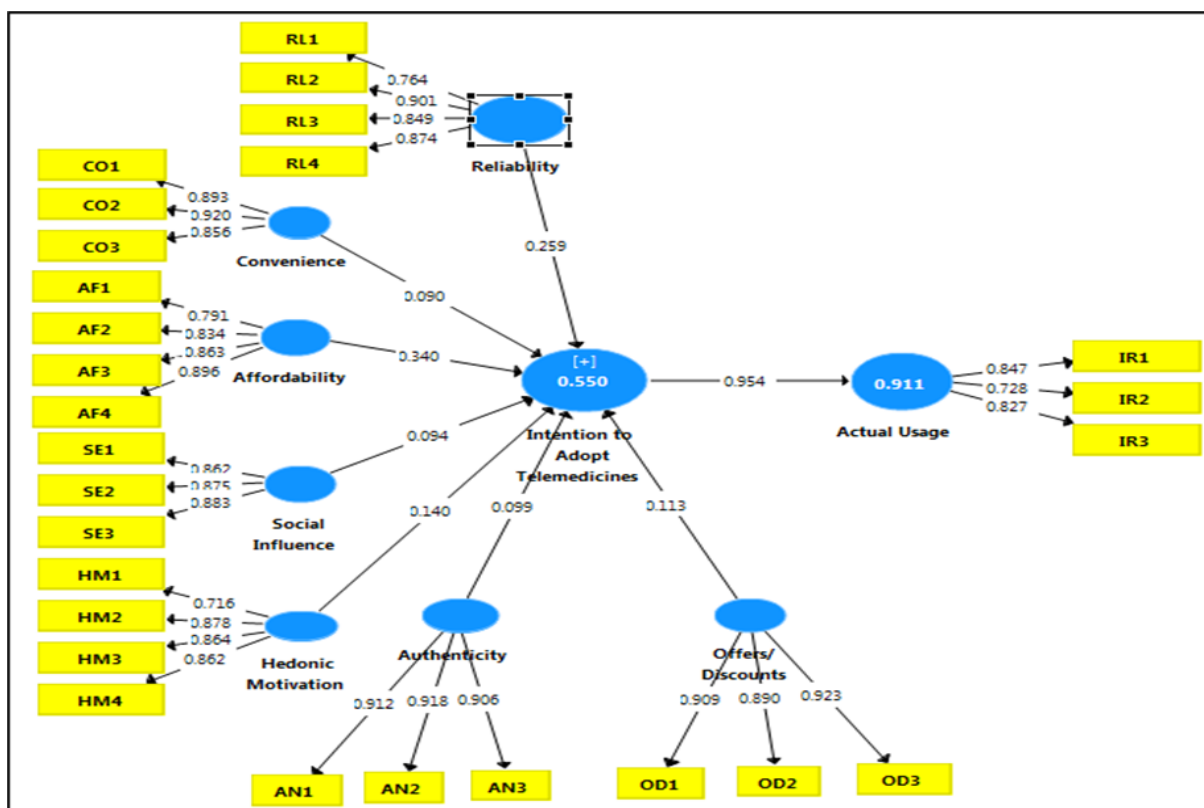
FIGURE 2. STRUCTURAL MODEL

TABLE 4. PATH COEFFICIENTS

Hypothesis	Path	Standardized β	T Statistics	P Values	Result
H1	AF -> IAT	0.34	7.17	0	Supported
H2	AT -> IAT	0.099	2.71	0.007	Supported
H3	CON -> IAT	0.09	2.13	0.034	Supported
H4	HM -> IAT	0.14	2.00	0.046	Supported
H5	IAT > AU	0.954	161	0	Supported
H6	OD-> IAT	0.113	2.82	0.005	Supported
H7	REL -> IAT	0.259	3.81	0	Supported
H8	SI-> IAT	0.094	2.57	0.01	Supported

Authors' Calculation

[DO NOT DELETE SECTION BREAK]TABLE 5. MODERATION EFFECT

Hypothesis	Moderating Effect of Covid-19	Standardized β	T Statistics	P Values	Result
H9(a)	AF -> IAT	0.082	2.72	0.007	Supported
H9(b)	AT -> IAT	0.051	1.85	0.065	Not-Supported
H9(c)	CON->IAT	0.063	2.26	0.024	Supported
H9(d)	HM -> IAT	0.073	2.41	0.016	Supported
H9(e)	OD -> IAT	0.114	3.47	0.001	Supported
H9(f)	REL ->IAT	0.099	2.84	0.005	Supported
H9(g)	SI-> IAT	0.059	1.73	0.084	Not-Supported

Authors' Calculation

Discriminant validity of the scale is assessed using the Forner and Lacker criteria, shown in Table 3 and found to be significant [23].

STRUCTURAL MODEL

The structural model was examined using SEM in SMART PLS3 software. The structural model is shown in Figure 2 and results of SEM analysis is reported in Table 4

Table 4 represents the estimated values of the sample mean (β), t-statistics, its p value and result. All the path coefficient is found positive in nature. The selected seven factors, namely reliability, convenience, affordability, social influence, hedonic motivation, authenticity and offers/discounts are observed to have noteworthy influence on the intention to adopt telemedicine.

Due to these findings the hypotheses H1, H2, H3, H4, H5, H6 and H7 are accepted. The most significant factor influencing the intention to adopt telemedicine is affordability as compared to the remaining factors (path coefficient = 0.340). Further, the intention to adopt tele-medicine found to have significant positive influence on the actual usage of the telemedicine (path coefficient = 0.954). The results supported the hypothesis H8.

The R square value which evaluates the strength of the proposed model explains 55% of the intention to adopt tele-medicine, which signifies that the variables taken in the conceptual model shows 55% variation in the construct-intention to adopt telemedicine. Furthermore, 91.1% of variations in the actual usage of telemedicine among the people in the sample study.

MODERATING EFFECT OF COVID-19

PLS-SEM bootstrapping procedure empirically examined the moderating role of Covid-19 on the relation among various factors and intention to adopt telemedicine. The bootstrapping results in Table 5 show that 'Effect of COVID-19' supportable and positively moderates the effect of Affordability (β=0.082), Reliability (β=0.099), Convenience (β=0.063), HM (β=0.073) and Offers/Discounts (β=0.114), on Intention to Adopt Telemedicine. The results of bootstrapping also show that "Effect of Covid-19" do not moderate the effect of "Social Influence" and "Authenticity" on "Intention to adopt telemedicine" [22].

PREDICTIVE RELEVANCE AND EXTERNAL VALIDITY

The predictive relevance of the results of the study is examined after the application of blindfolding on smart PLS 3. The value of Q-square is 0.58 for 'Actual Usage' and 0.40 for 'Intention to adopt telemedicine', which is more than 0.35 and shows that the study is moderately relevant and valid externally.

IMPLICATIONS OF THE STUDY

The increasingly busy and connected schedules of people in the cities leaves a little time to physically shop for medicines and other health products, hence telemedicine has given an opportunity to buy the medicines online without approaching the medical stores and other shops. The current study has highlighted the different factors which are encouraging the customers to adopt the telemedicine and continue to its actual usage. The findings of the study provide implications with the opportunities, application, and factors that can be used by retailers and suppliers of medical services and medicines to attract more and more customers.

CONCLUSION

COVID-19 outbreak forced the government of different countries to undertake lockdown and instructed people to maintain social distancing. It has become difficult for people to approach markets and obtain medicines. During the lockdown period, when people were compelled to depend on e-shopping for their day-to-day basic needs, these consumers also utilized the services of telemedicine. Currently in the epidemic, this study has examoned distinct influential variables of intention to adopt telemedicine by the people. The intention to adopt telemedicine is the construct that strongly influences the actual usage of telemedicine in developing countries. The scope of the study is restricted to the northern region of India therefore future studies can be conducted in relation a whole global perspective of consumers.

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