Consumers' Usage Intention Towards Mobile Healthcare Applications (MHA): A Study of Select Cities in India

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ABSTRACT

This paper attempts to identify the factors influencing Consumers' usage intention towards mobile healthcare applications. There are many healthcare applications that are being launched in the market which would help consumers in preventing and curing the diseases. The promotional initiatives in healthcare market have made consumers conscious about their appearance and health such that demand for healthcare applications has increased considerably. Through thorough review of literature it was found that perception, trust and social factors influence usage intention of consumer patients towards mobile healthcare applications. The primary data has been collected from respondents belonging to region of Delhi-NCR, Chandigarh and Ludhiana. Smart PLS 2.0 software has been used for Confirmatory factor analysis of data where Correlation, t-statistics and composite reliability tests etc. have been applied. The results showed that perception, consumer trust and social factors influence the usage intention of consumers towards mobile healthcare applications. The mediation effect of consumer trust was also studied and it was found that there is partial mediation effect of consumer trust on both perception and social factors in relation to usage intention.

Keywords: Mobile Healthcare Applications (MHA), Consumer Perception, Consumers Usage Intentions.

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1. INTRODUCTION

The usage rate of smartphones have increased intensely such that people have become dependent on mobiles for doing almost every task. The mobile healthcare applications are in trend these days and few examples of such applications are Healthifyme, Mfine, Samsung health and Google fit etc. These applications provide thick and thin details to health conscious consumers like calorie count, activity tracking and so on. They also offer the services of doctor, dietician and nutritionist etc. on payment basis. In general, health related decisions are taken mutually on the recommendations of near and dear ones. Thus, word of mouth (WOM) is perceived to be a major source of information in medical area. The past experiences of the consumer patients help the other consumers to take better decisions for their health related problems.

An increasing population of India is the main reason for inadequate and inferior quality of medical services provided to people. Thus these applications can be helpful to those who want to detect and prevent diseases at an initial stage but the problem is that many people are not aware about these applications as the promotional activities are not undertaken by marketers on mass scale. People hesitate in going to hospitals and waiting in long queue, thus these applications help in receiving the consultation online at minimal cost. Since the personalized services are being provided online, consumer's privacy is also maintained (Rogers, 1995). Through app consumer patients can easily access their past records and history of illness and make comparisons accordingly. Some people feel shy in facing doctor and some people do not have time to visit doctors as per their convenience, thus mobile applications can be useful for such consumers (Swaminathan et al., 1999).

Healthy people create and build a strong economy which will definitely lead to better conditions in a country (Blosch, 2000; Hamid & Kassim, 2004). There are over 50,000 healthcare applications available on Google play store and Apple play store which consumers can download freely. Some of them provides information collaborated from various resources, some help consumers in tracking their health records and some in getting consultation from medical professionals etc. There is a contradiction that on one hand marketers are encouraging people to use mobile healthcare

applications and on the other hand medical sciences is discouraging the excess use of mobile phones because of its harmful effects. Some researchers have provided advantages of healthcare applications like*, Ease of access; Control over self; open communication lines over the globe and Daily monitoring (Rogers, 1995).* These applications can be proved as a boon for people with different kinds of disability and can help to save many lives. These applications have given a boost to nutraceutical companies as well which has led to increase in demand for health, dietary supplements and other medicinal products. However, proper laws and regulations are still pending to be formed which can authenticate such applications. These applications cannot eliminate the requirement of visiting doctor as some treatments require proper inspection.

2. NEED FOR STUDY

The new developments in technology have made smartphone as a more effective tool to perform almost every task. The latest Smartphone applications also include healthcare applications which allow consumers/individuals to seek medical assistance over phone. Health conscious consumers can easily download app and track their health parameters. But, since these applications are not popular than other applications like food, movies and music applications, it is imperative to study the perception that people hold towards such applications. Consumers may have positive attitude towards these applications or may feel that applications are beneficial, but they might not be motivated enough to make actual use of applications. Thus, consumers may not be in the favour of including healthcare applications in their lifestyle. So, it becomes more relevant to understand the factors responsible for motivating consumers to use latest technology applications.

3. OBJECTIVES

1. To identify and study the factors influencing usage intention of consumers toward mobile healthcare applications (MHA).
2. To study the relationships between factors influencing usage intention and consumers usage intention of healthcare applications.

4. REVIEW OF LITERATURE

Mobile Healthcare Application (MHA)

Mobile healthcare application is a software that allows to attain information about health related issues without physically visiting the Doctor or Healthcare Professional. There are several benefits of MHA like, medical assistance, personalized diet chart, priority basis appointments, image sharing, prescription writing and consultation etc. It also provides a means of communication between two professionals and thus it enables sharing of information and knowledge on mass scale. Through these applications one can access medical and science news, dictionaries and articles etc.(Fan, Saliba, Kendall and Newmarch, 2005). Around 60% of the health professionals believe that these healthcare applications are very useful for both patient and doctors.

Different healthcare mobile applications provide different services like some are made for disseminating only the useful information; some are meant for constant monitoring of patient's health; some are developed for detecting the disease or problem and some for health maintenance purpose etc. These applications are not only meant for short term treatments but also for chronic conditions or long term treatment (Rogers, 1995).

Usage Intention*:* Usage intention may be defined as the willingness to use a product or a service (Morris and Venkatesh, 2000). The usage intention of Mobile Healthcare Applications (MHA) is influenced by many factors like awareness level, consumer trust, social factors, consumer personality, perception and attitude towards such new technology etc. (Venkatesh et al., 2003; Lu et al., 2008; P.V.C. Chang, 2004; Rogers,1995).

Many researchers have studied the concept of "consumer behavior" in order to predict and devise strategies for understanding the behavior of buyers in market. There are several factors that affects the behavior of buyer i.e. Demographics, Personality, Attitude, Perception, Social factors, Cultural factors, Situational factors, Trust over seller and Intention etc. However, the kind of influence that a particular variable will have on a dependent variable depends upon the object of study. Venkatesh et al. (2003) studied that perception and awareness level of software users determines the success of mobile applications in market. (Schiffman,

Kanuk, Ramesh, & Wisenblit, 2010)

After a thorough review of various concepts and factors studied in past, it was decided that the most important and relevant factors shall be considered for the study. Thus four factors i.e. Demographics, Consumer's trust, Perception and Social factors were included for research. These factors have been discussed in studies of Schiffman, Kanuk, Ramesh, & Wisenblit (2010), Venkatesh et al. (2003) and Lu et al., (2008).

Factors influencing Usage Intention towards Mobile Healthcare Applications (MHA)

***Demographical factors:* -** There are studies revealing that there is difference between the "acceptance of new technology" intention of males and females (Morris and Venkatesh, 2000). Working females engaged in multiple tasks may not get time to visit doctor and thus may prefer seeking treatment or consultation online. Similarly age also affects the usage intention i.e., older generation who face difficulty in using applications may favour the traditional method of consultation (Dwivedi and Lal, 2007).

Consumer Trust: - Trust refers to the belief and faith that one party has over the other party. Different disciplines may perceive the meaning of trust differently. Perception regarding privacy and security of personal information plays a critical role in success of healthcare mobile application. Application users should always feel that their health and illness related data would remain confidential all the time." When consumers make payment of fees online, their accounts shall be secured from different kinds of fraud and hacking. Thus privacy and security both affects the consumer trust. The company shall not share the data with any other marketer.

Social Factors: - The family life cycle shows that when a child is born, he passes through various stages of the life cycle where his needs and preferences change with the time. These preferences are not only affected due to personal needs but also due to the effect of people surrounding an individual. An individual learns the most from those people with whom he/she interacts frequently. Socio-cultural theorists believe that an individual cannot grow intellectually until there is communication between different groups. Thus, if the people around an individual are health conscious then there is a probability that the individual would also behave

in the same manner (Fan, Saliba, Kendall and Newmarch, 2005). There are few countries like Saudi Arabia, Iran and Iraq etc. where sharing personal information openly is undesirable and thus, it becomes difficult to influence people to use mobile healthcare applications. (Al-Sobhi, 2011).

Perception: **-** Perception involves the interpretation of various stimuli present in the environment. Perception is a part of psychology discipline which involves the study of human mind. Consumer behavior or consumer patient behavior cannot be studied in isolation and therefore through better understanding of human psychology one can interpret the usage intention of consumers towards healthcare applications.

5. HYPOTHESES

The in-depth study of literature revealed contradictory results that need to be verified and thus following hypothesis are being considered relevant for the study:-

$\mathbf{H_{01}}$- There is no significant relationship between Perception and Usage intention of consumers for mobile healthcare applications.

$\mathbf{H_{02}}$- There is no significant relationship between Consumer Trust and Usage intention of consumers for mobile healthcare applications.

$\mathbf{H_{03}}$- There is no significant relationship between Social factors and Usage intention of consumers for mobile healthcare applications.

$\mathbf{H_{04}}$- Consumer Trust doesn't mediate the relationship between Perception and Usage intention of consumers for mobile healthcare applications.

$\mathbf{H_{05}}$- Consumer Trust doesn't mediate the relationship between Social factors and Usage intention of consumers for mobile healthcare applications.

$\mathbf{H_{06}}$- There is no significant difference in Perception of consumers belonging to different Demographic categories.

$\mathbf{H_{07}}$- There is no significant difference in Trust of consumers belonging to different Demographic categories.

$\mathbf{H_{08}}$- There is no significant difference in Social factors of consumers belonging to different Demographic categories.

H_{09}- There is no significant difference in Usage intention of consumers belonging to different Demographic categories.

H_{10}- There is no significant difference in Usage intention of consumers residing in different cities (Delhi, Ludhiana, and Chandigarh).

6. RESEARCH METHODOLOGY

The research is based on Primary source i.e., *Questionnaire* which is developed after thorough examination of various concepts and theories already developed by past researchers.

Questionnaire: The questionnaire had 2 sections consisting of 15 questions in totality. The first section was meant to collect data related to consumer demographics. Second section was meant to collect the data related to consumer's perception towards healthcare applications, Consumer trust over healthcare applications, social factors and usage intention of consumers. The questions were close ended in the form of multiple choice questions and statements were measured on 7 point likert scale. The likert scale points have following description- *7– Strongly disagree, 6– Disagree, 5– Somewhat disagree, 4 – Neither agree or disagree, 3– Somewhat agree, 2 – Agree, 1– Strongly agree.*

Table-1: Statements measuring Perception, Trust, Social factors and Usage Intention

Factors	Measurement statements
Perception towards Mobile Healthcare Applications (Sinha & Varghese, 2015)	**P1-** Mobile healthcare applications will help in improving the health of patients. **P2-** Mobile healthcare applications will help in creating awareness amongst public. **P3-** It is better to use mobile healthcare applications than to visit clinics personally. **P4-** Mobile healthcare applications may help in preventing diseases. **P5-** Mobile healthcare applications will help patient to communicate with healthcare professional.
Social factors	**S1-** I prefer using those applications which my family, friends, and colleagues use. **S2-** I take the opinion of my family and friends for taking any decision. **S3-** I definitely consider recommendations of my family, friends and colleagues **S4-** I seek support of my family, friends and colleagues

Consumer Trust on mobile applications	**C1**- I trust mobile applications. **C2**- I will be happy to receive doctors' medication over mobile. **C3-** I feel that healthcare applications are safer to use.
Usage intention (Sezgin, Yildirim, & Yildirim, 2016)	**I1**- I intend to use mobile health care applications. **I2**- I plan to use mobile health care applications in next few months. **I3**- I don't mind in using mobile healthcare applications.

Source: (Sinha & Varghese, 2015), (Sezgin, Yildirim, & Yildirim, 2016)

The statements of Perception were drafted to understand belief, views and opinion that consumers have towards MHA. The social factor statements measure intensity of influence that society has on consumers' decision making, habits and behaviour. Consumer trust statements try to measure the level of trust that consumers hold towards services of such mobile applications. Finally, usage intention statements measures the intention of consumers to use MHA at present and in near future.

Sample Size:-:- Convenience sampling method was followed for collection of data. The questionnaire was distributed through email and Google form links in three cities i.e. Delhi-NCR, Chandigarh, Ludhiana. Around 362 questionnaires were filled, out of which only 291 were complete and considered for analysis. It took 3 months to collect the data online. Pilot testing was done on 40 respondents before the final circulation of questionnaire. Demographics include Gender (Male, female); Age *(18-21 years; 22- 25 years;26- 35 years; 36 years & above);* Education *(Graduate, Post graduate and PhD degree holder);* Occupation (*Service; Business; Student; Homemaker; Unemployed*);Monthly family income *(Rs.10,000- Rs.50,000; Rs. 50,001- Rs. 1,00,000; Rs. 1,00,001& above).*

Statistical tools applied:- There are two kinds of analysis i.e. exploratory factor analysis and confirmatory factor analysis. Exploratory analysis is performed when the numbers of factors are not known and confirmatory analysis is performed when the factors influencing dependent variables are known. Smart PLS 2.0 software has been used for Confirmatory factor analysis of data where correlation, t-statistics and composite reliability tests etc. have been applied. The reasons for using PLS-SEM are; *better explanation of variance, estimation is possible even with small sample size, elaborative study of relationships through two models i.e. measurement model and structural model.*

Since, it is not possible to study the influence of demographics directly in Smart PLS 2.0 software, therefore in order to study the impact of demographic categories, IBM SPSS 20.0 software has been used for multi group analysis (i.e after performing ANOVA).

7. ANALYSIS AND RESULTS

Demographics

Table-2 shows the demographic characteristics of the respondents. Around 50% respondents were male and 50% were females. Out of 290 respondents, 34.48%, 31.72% and 33.79% respondents were from Delhi, Chandigarh, and Ludhiana respectively.

Table -2: Demographic category

	Frequency	Percentage
Age		
(18-21 years)	65	22.41 %
(22- 25 years)	96	33.10 %
(26- 35 years)	68	23.44 %
(36 years & above)	61	21.03 %
Gender		
Male	145	50 %
Female	145	50 %
Education		
Graduation	111	38.27 %
Post Graduation	95	32.75 %
PhD degree holder	35	12.06 %
Others	49	16.78 %
Occupation		
Service	134	46.20 %
Business	81	27.93 %
Student	46	15.86 %
Homemaker	22	7.86 %
Unemployed	07	2.41 %
Family Monthly Income		
(Rs.10,000- Rs.50,000)	77	26.61 %
(Rs. 50,001- Rs. 1,00,000)	107	36.89 %
(Rs. 1,00,001& above)	106	36.55 %
No. of Respondents from various cities		
Delhi	100	34.48 %
Chandigarh	92	31.72 %
Ludhiana	98	33.79 %

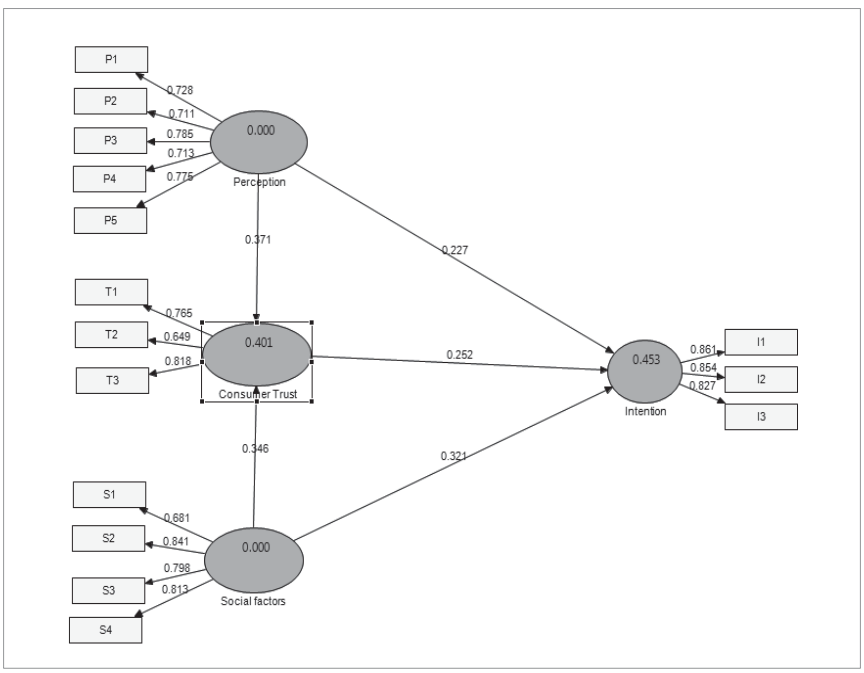
Source: Primary Data

Model Estimation

Using smart PLS version 2, PLS algorithm was run where maximum iterations were set to 300. To test the significance of results, bootstrapping was run (Wong, 2013). The results are shown in figure-1 where Perception, Consumer Trust, Social factors are Independent variables and Usage Intention is a Dependent Variable. Perception construct is loaded on 5 statements, Consumer Trust is loaded on 3 statements, Social factors are loaded on 4 statements and Usage intention is loaded on 3 statements.

Assessment of Reflective Measurement Model

Figure-1:- PLS path model (drawn in smart-PLS 2.0 version) after PLS Algorithm calculation



In figure-1 the results of PLS algorithm are shown, where 45.30% of variance is explained through Perception, Consumer Trust and Social factors. Also, consumer trust acts as a mediator between perception and intention; social factors and intention. As per the Technology acceptance model (TAM) by Davis (1989) R^2 value closer to 0.49 is acceptable. Our

model depicts a value nearer to 0.49 and since we have not considered other possible independent variables, so R^2 explanatory power is lower in this case.

In order to assess the reflective measurement model, four kinds of test are conducted i.e. Internal consistency, Reliability test, Convergent validity and Discriminant validity (Hair, 2009, Petter et al., 2007). Mediation effect was also evaluated and it was found that there is partial mediation effect of consumer trust on other independent variables.

Table-3: Convergent Validity and Composite Reliability

	AVE	Composite Reliability	R Square	Cronbach's Alpha
Consumer Trust	0.5585	0.7899	0.4011	0.6044
Intention	0.7183	0.8844	0.4528	0.8046
Perception	0.5524	0.8603	0	0.7977
Social factors	0.6171	0.865	0	0.7924

Source: Primary data

The first criterion is met where **composite reliability** is present as all the values for reflective construct are above threshold value i.e. 0.70 (Table-3: composite reliability column). For convergent validity all the values shall be above 0.50 and results show that AVE value for each reflective construct is above 0.50. Thus **convergent validity** is also met (Table-3). The values of cronbach alpha are above 0.70 for all except consumer trust, however some researchers have accepted the alpha values above 0.60.

Table-4: Individual Indicator Reliability

Factors	Usage Intention	Perception	Social factors	Consumer Trust
I1	0.861	0	0	0
I2	0.854	0	0	0
I3	0.827	0	0	0
P1	0	0.728	0	0
P2	0	0.711	0	0
P3	0	0.785	0	0
P4	0	0.713	0	0
P5	0	0.775	0	0
S1	0	0	0.681	0
S2	0	0	0.841	0

S3	0	0	0.798	0
S4	0	0	0.813	0
T1	0	0	0	0.765
T2	0	0	0	0.649
T3	0	0	0	0.818

Source: Primary Data

Individual indicator reliability is verified through the outer loadings of reflective constructs (Table-4). The minimum acceptable value is 0.70. In the table, S1 and T2 have values less than 0.70. Since the difference was not major, so it was decided to consider the indicators for subsequent analysis.

Table-5: Discriminant Validity (Fornell-Larcker criteria)

	Consumer Trust	**Intention**	**Perception**	**Social Factors**
Consumer Trust	**0.747**			
Intention	0.557	**0.848**		
Perception	0.565	0.549	**0.743**	
Social factors	0.554	0.587	0.561	**0.786**

Source: Primary Data

In table-5, all the values are largest among their corresponding row and columns value, therefore discriminant validity is met as per Fornell-Larcker criteria.

Multicollinearity

In order to check if there are any collinearity issues, VIF values are assessed i.e. all the VIF values for each construct should be less than 5. The results derived from PLS algorithm report shows that all VIFs value are less than 5, therefore there is no collinearity issue between the constructs.

Significance and relevance of structural model relationships

The path coefficients generated in report of PLS algorithm explains the relationship between constructs of structural model. In figure-1, R^2 value of endogenous constructs is depicted inside the circle. The value of path coefficient ranges between +1 to -1 i.e. value closer to +1 depicts strong positive relationship and a value closer to "0" depicts weaker relationship.

The PLS algorithm does not provide significance or t-statistics calculation. Therefore, using bootstrapping option the significance of path coefficient has been tested. The critical t values at significance level 1%, 5%, 10% are 2.57, 1.96 and 1.65 respectively (two-tailed tests). Table-6 shows that all the paths are significant at 1% significance level except for Consumer Trust -> Intention and Perception -> Intention which are significant at 5% significance level.

Table-6: Significance or t statistics

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)
Consumer Trust -> Intention	0.2517	0.2507	0.1093	0.1093	2.3033*
Perception -> Consumer Trust	0.371	0.3771	0.1078	0.1078	3.4434**
Perception -> Intention	0.2267	0.2376	0.1115	0.1115	2.0327*
Social factors -> Consumer Trust	0.3458	0.3481	0.1025	0.1025	3.3723**
Social factors -> Intention	0.3205	0.3169	0.1173	0.1173	2.732**

Significance p>0.05* and p>0.01***

Table-7: Path Coefficient values

	Consumer Trust	Intention
Consumer Trust	-	0.252
Perception	0.371	0.227
Social factors	0.346	0.321

Source: Primary data

Social factor has largest path coefficient (0.321) towards intention followed by Consumer trust (0.252) path coefficient towards intention.

Mediation Effect

In order to study the mediation effect of consumer trust, firstly PLS algorithm option was run without linking consumer trust factor with other independent variables (figure-2). The results showed that there is

significant relationship between perception and intention (p=3.01); social factors and intention (p=4.11) when the mediator is not present.

Figure-2:- PLS path model (drawn in smart-PLS 2.0 version) without mediation effect

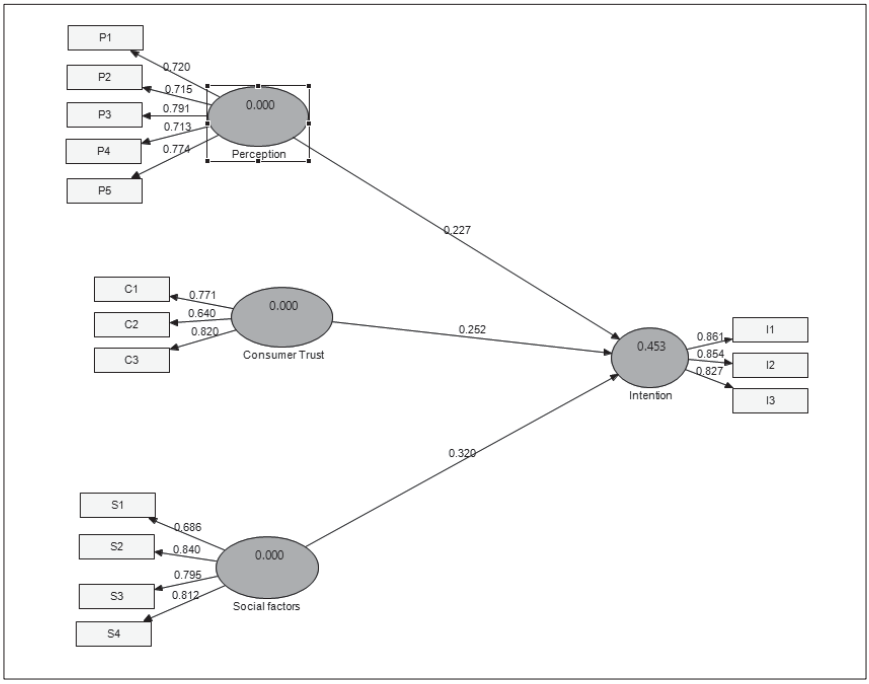


Figure-2 shows the PLS algorithm results when there is no mediator i.e. consumer trust is not connected to perception and social factors. Both perception and social factors together explains 45.30% of variance in Usage intention of consumers. After running bootstrapping, it was found that the relationship between perception and usage intention; social factors and usage intention is significant even when mediator is not present. Thus there is partial mediation effect of consumer trust.

Table-8: Significance analysis of Indirect effect through mediator

	Direct	Indirect (Mediation effect of consumer trust)	Total Effect	Variance Accounted For (VAF) = Indirect Effect/Total Effect
Perception -> Intention	0.227	0.093**	0.32	0.29
Social factors -> Intention	0.321	0.087***	0.408	0.21

Significance p>0.05* and p>0.01***

Another method (Table-8) for checking full mediation or partial mediation effect is the VAF value method. If the VAF value ranges between 0.20 and 0.80 then it is inferred that there is partial mediation (Hair, 2009). In table-8, the VAF value is between 0.20 and 0.80, therefore it can be concluded that consumer trust has partial mediation effect on relationship of both perception with usage intention and social factors with usage intention.

Multi Group Analysis

In order to study the relationship between demographic categories and dependent variable (i.e. usage intention) Tukey HSD test was applied using IBM SPSS software. Also, relationship between demographic categories and independent variables (perception, trust and social factors) was studied. It was also checked whether there is any difference in perception, trust, social influence and intention among consumers of three cities (Delhi, Ludhiana, and Chandigarh). The following results were obtained:

Table-9: Multi Group Analysis Results

Category	Result	Summary
Age	Significant*	There is difference in trust level of consumers i.e. consumers of *36 yrs & above* age trust MHA (mobile health applications) greater than consumers of *26- 35 years age*
Gender	Insignificant	There is no difference in perception, trust, social influence and usage intention of males and females.
Education	Insignificant	Consumers possessing different educational qualifications have similar perception, trust, social influence and usage intentions.
Occupation	Insignificant	Consumers from different occupational background do not differ in relation to perception, trust, social influence and usage intention.
Family Income	Insignificant	Family income of consumers does not have any role in perception, trust, social influence and usage intention.
City	Insignificant	There is no difference in perception, trust, social influence and intention among consumers of three cities (Delhi, Ludhiana, and Chandigarh).

Significance p>0.05*

Hypothesis Testing

Table-10: Hypothesis Testing Results

	Hypothesis	Accepted/Rejected
H_{01}	There is no significant relationship between Perception and usage intention of consumers for mobile healthcare applications.	**Rejected**
H_{02}	There is no significant relationship between Consumer Trust and usage intention of consumers for mobile healthcare applications	**Rejected**
H_{03}	There is no significant relationship between Social factors and usage intention of consumers for mobile healthcare applications	**Rejected**
H_{04}	Consumer Trust doesn't mediate the relationship between Perception and usage intention of consumers for mobile healthcare applications	**Rejected**
H_{05}	Consumer Trust doesn't mediate the relationship between Social factors and usage intention of consumers for mobile healthcare applications.	**Rejected**
H_{06}	There is no significant difference in Perception of consumers belonging to different Demographic categories.	**Accepted**
H_{07}	There is no significant difference in Trust of consumers belonging to different Demographic categories.	**Rejected**
H_{08}	There is no significant difference in Social factors of consumers belonging to different Demographic categories.	**Accepted**
H_{09}	There is no significant difference in Usage intention of consumers belonging to different Demographic categories.	**Accepted**
H_{10}	There is no significant difference in Usage intention of consumers residing in different cities (Delhi, Ludhiana, and Chandigarh).	**Accepted**

Source: Primary Data

Table-10 shows that hypothesis $H_{01,}$ $H_{02,}$ $H_{03,}$ $H_{04,}$ $H_{05,}$ H_{07} are rejected and hypothesis $H_{06,}$ $H_{08,}$ $H_{09,}$ H_{10} are accepted.

8. FINDINGS

The results of PLS algorithm shows that 45.30% of variance is explained through Perception, Consumer Trust and Social factors. This means that perception, consumer trust and social factors influence the usage intention of consumers towards mobile healthcare applications. The mediation effect

of consumer trust was also studied and it was found that there is partial mediation effect of consumer trust on both perception and social factors in relation to usage intention. In order to assess the reflective measurement model, four kinds of test were conducted i.e. Internal consistency, Reliability test, Convergent validity and Discriminant validity (Hair, 2009, Petter et al., 2007). The model meets criteria of all four tests. Since PLS algorithm does not provide the significance or t statistics calculation, therefore, using bootstrapping option the significance of path coefficient was tested. The critical t values at significance level 1%, 5%, 10% are 2.57, 1.96 and 1.65 respectively (two-tailed tests). All the paths were significant at 1% significance level except for Consumer Trust -> Intention and Perception -> Intention which were significant at 5% significance level. Therefore the null hypotheses were rejected and alternate hypothesis were accepted.

In case of categorical data, multi group analysis was conducted where after ANOVA, Tukey HSD test was applied. The results showed that gender, educational qualification, occupation, family income and resident area does not have any role in perception, trust, social influence and usage intention of consumers. This means that there must be several other factors responsible for changing consumer behavior. It was seen that the level of trust differs across two age categories (*26- 35 years age and 36 years above)* which means that with increasing age, a consumers trust more on mobile health applications for keeping themselves fit and healthy.

9. CONCLUSION

Mobile healthcare applications are popular all over the globe and are gaining popularity in India. A person may forget his/her wallet but may not his/her smartphone, as it has become a necessity today. However, the result shows that there is still an ample scope to tap new segments as many potential consumers are still unaware. Consumers may have positive image and positive attitude towards healthcare applications but the usage intention may become negative due to situational or contingent factors.

Analysis has revealed that there is positive relationship between perception and usage intention of consumers. This means that higher the positive perception towards MHA, higher would be the usage intention towards

MHA. Similarly, higher the trust on MHA, higher would be the usage intention of consumers. The usage intention of MHA is also influenced by social pressure that a consumer faces. If family, friends and acquaintances favour the usage of MHA, then there are chances that a particular consumer would also develop intention to use MHA.

While devising the mobile healthcare applications, it is very important that security and privacy of consumers is maintained because lower trust levels will lead to decrease in usage of such applications. Health is a sensitive area, therefore marketers need to understand the expectations and demand of consumers. It is imperative to study the consumer behavior in relation to MHA.

A combination of various promotional tools can help in changing the perception of consumers towards MHA. Advertisements with relevant facts can help in building trust among consumers as it will assure them that they are dealing with an established and trustworthy application.

Mobile healthcare applications have helped consumer patients in changing their bad habits and behavior through tracking, goal setting and self-control etc. However, potential consumers will prefer only those applications which can be operated effortlessly as it will save both time and money (Shaheen, 2016) .There is lack of motivation and self-discipline among consumers due to which it has become difficult to convince them to use mobile healthcare applications.

The results of study will help consumers, marketers and application makers such that MHA makers can build a reliable application and for changing perception of prospective consumers, marketers can focus on promotion. As a result of this, consumers will obtain the benefit and privilege of using secure and instant healthcare services.

10. LIMITATIONS

Every limitation provides a scope for future research so that new relationships can be discovered. There are following pitfalls in the study that can be considered in future researches-

- The data has been collected from selected cities i.e. Delhi, Ludhiana and Chandigarh, thus the results cannot be generalized all over India.

- Secondly, only four factors have been undertaken in the research, therefore there is need to explore more factors that may depict a different picture. The other factors that may be considered are attitude, learning, personality and motivation etc.
- More useful information could have been ascertained through in-depth analysis by applying other tests as well.
- There may be more number of mediators that may influence the relationship between independent factor and Dependent factor.

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