Perceived Risk and Online Purchase Intention of E-Pharmacy: Examining the Moderating Role of Online Trust in the Indian Context

Varghese Assin T J1*, Dr. Nimmy A George2, Dr. P Sivakumar3

Corresponding author: Varghese Assin T J

Address: 1* Research Scholar, Department of Business Administration, Annamalai University, Tamil Nadu, India; 2Assistant Professor, Department of Commerce, Bharata Mata College, Kerala, India; 3 Assistant Professor, Department of Business Administration, Annamalai University, Tamil Nadu, India

vfrassin@gmail.com, nimmy@bharatamatacollege.in, sivakumarbaski@gmail.com

Abstract

Online pharmacies in India are facing the challenge of creating market share and consumer relevance within e-commerce segment. This paper aims to empirically explore the drivers and barriers of online purchase intentions, namely perceived risk and online trust among non-adopters of online pharmacy. It proposes a model explaining how risk dimensions of perceived risk towards online pharmacy impacts online consumers' purchase intention and the moderating effect of online trust in its relationship. Sample size of 740 online consumers was considered in the study and the technique of Structural Equation Modelling, SPSS and Hayes Process were employed. An online and offline questionnaire was administered at internet users who had prior online shopping experience. Confirmatory factor analysis was used to evaluate the research constructs, validity, and composite reliability. The results of the study demonstrate that perceived risk is a significant factor influencing online purchase intention toward online pharmacy in India.

In accordance with the literature reviewrelated to risk perception and antecedents of trust ine-commerce, three major risk perceptions, connected with e-pharmacy were finalized for testing the moderating role of online trust. The survey was conductedwith a questionnaire to include differentperspective of non-adopters of online pharmacy across India.

The study contributed to the moderating effect of trust factor on the risk perception towards e-pharmacy inIndian context. The results indicated three major dimensions of risk perception such as financial risk, physical risk, and source risk have varied impact on purchase intention with the moderating effect of trust.

The managerial implications of this study would assist both the marketers and policy makers to adopt the mechanisms tostrategize business prospective among potential consumers of online pharmacy.

Keywords: E-Pharmacy, Online Trust, Risk Perceptions, E-Commerce, Online Purchase Intention

Abbreviations

AGFI: Adjusted Goodness of Fitness Index

AMOS: Analysis of Moment Structures

AVE: Average Variance Extracted Covariance

CFA: Confirmatory Factor Analysis

CI: Confidence Interval

CR: Composite Reliability

DV: Dependent Variable

EFA: Exploratory Factor Analysis

FR: Financial Risk

GFI: Goodness of Fit Index

IV: Independent Variable

KMO: Kaiser-Meyer-Olkin

LLCI: Lower Level Confidence Intervals

RP: Risk Perception

OP: Online Pharmacy

OPI: Online Purchase Intention

OT: Online Trust

PR: Physical Risk

R2 : Squared multiple correlation

RMR: Root Mean Square Residual

RMSEA: Root Mean Square Error of Approximation

SEM: Structural Equation Modelling

SPSS: Statistical Package for the Social Sciences

SR: Source Risk

ULCI: Upper-Level Confidence Intervals

VIF: Variance Inflation Factors

$\chi 2$: Chi-Squared Statistic

$\chi 2$ /d.f : Normed-Chi-Square

Introduction

Market studies demonstrated that consumers browse websites for information but rarely it is translated into the buying stage and in the purchase decision process (Chen and Barnes, 2007). Literature suggested that there are two key important factors that influence the buying process; the factors that hinder the consumer to buy online (Pauzi *et al.*, 2017)and the factors that promote the consumers to go online (Hadining, Haryanti and Munajat, 2020). Precisely, consumer behaviour and consumers' purchase intention depend on various influencing factors which make the measurement of those variables difficult under varying circumstances. Especially, regarding the online purchase, the presence of intangibility adversely affect the online purchase of medicinestoo (Fittler et al., 2018). Consumers are faced with vagueness and uncertainty about the consequences of their decisions when they purchase a product or service (Flanagin et al., 2014). This feeling of uncertainty is greater in an online context where direct interaction with product or service is absent. Thus, this unsurety contribute risk perception towards the product that they have selected the right product, e-vendor, brand or mode of purchase and payment.

Despite this invariable online behaviour of consumers, the adoption of e-pharmacy grabs more attention in terms of consumer perceptions and purchase intentions (Srivastava & Raina, 2020; Ma, 2021). In this context, researchers identified that risk perceptions and consumers' trust are critical variable influencing online purchase decisions (Ariffin et al., 2018). Furthermore, the studies projected that there is a corelation between risk perception and trust factors in view of online purchase behaviour (D'Alessandro et al., 2012) and is reciprocal relationship (Chang & Chen, 2008). However, it's directionally is under question in each online circumstance (Wagner et al., 2020). Incidentally, context is an important element in the formation of consumer behaviour as it vary according to geographical location, prior experience, demographics etc.,(Svorc, 2012; Cao & Niu, 2019). Therefore, in the Indian context online pharmacy, consumers buying behaviour is a point of research.

Drawing from the aforementioned literature, there are various approaches and theoretical foundations of online purchase intention were discussed. Technological Acceptance Model, Theory of Planned Behaviour, Theory Reasoned Action,Theory of RiskPerception (TRP), Theory of Innovation Diffusion, Unified Theory of Acceptance and Use Technology (UTAUT) are some of the prominent conceptual theories to formulate strategies for consumer buying behaviour. According to the studies on online purchase of medicaments, there is general consensus among the researchers on the inherent risk factors of consumers towards e-pharmacy across globe (Sabbir, Islam and Das, 2020). Therefore, among those, this study adopted TRP as the conceptual basis to understand the risk perception and online purchase intention through the interaction of online trust. On the other hand, Social Exchange Theory (SET) suggested that trust is the most precious asset of any business (Chen et al., 2015). Trust has been defined as ''a willingness to rely on an exchange partner with the perception of confidence in their reliability and integrity (Morgan & Hunt, 1994). In short, prominent theories articulate and describe online trust into three basic models such as personality-based trust, institutional based trust, and cognitive-based trust (Kooli et al., 2014). Since, this study is focused on e-transaction and exchange, the institution-based trust is advised to develop a conceptual model to predict the purchase intention towards e-pharmacy. Because, online trust is found to be the crucial element in online purchase behaviour across all segments(Kooli, Mansour and Utama, 2014). This frame work is unique and unattended till date in the online purchase of medicinesespecially in India. Given the lack of research on developing economies of Asia, this study focuses on India with the specific research focus being online consumers' risk

perception and purchase intention towards e-pharmacy. Since the focus of this study is online pharmacy adoption, which is of acceptance of innovative technology intertwined with personal characteristics and social systems, this research drew upon two primary research streams, theory of risk perception and social exchange theory to develop a unique research model and associated hypotheses.

Online Pharmacy

Unlike other products of e-commerce, medicine is a commodity with a special status because of its therapeutic effects (Pál *et al.*, 2015). Therefore, it is compulsorily dispensed with information as well warnings. If medicines are consumed unnecessarily or incorrectly, they may cause serious harm to health. World Wide Web has made healthcare products, including prescription- drugs, freely available to customers which were reserved with physician's recommendation only. Though freely available through internet, due to its special nature, drug supply is regulated and distinguished substantially from other goods. Hence, its distribution and commercialization require strict policies and regulations. This has differentiated online pharmacy from others.

Consumer healthcare is an important retail category in e-commerce. E-commerce has bypassed all those parameters and standards in terms of sale and distribution in terms of products and services (Bailey, 2005). Medicines are the critical category of products, falls under special scrutiny (Ashames *et al.*, 2019). Orizio et al. (2011) estimated that not more than 6% of the general population purchase medicines from internet pharmacies around the globe. In 2018, a study on Hungarian outpatients showed that 4.17% of the respondents of the survey purchase medicines online (Fittler et al., 2018). In Saudi Arabia 2.7% respondents have showed interest in doing purchase of medicines in the future (Abanmy, 2017). In 2018, only 6% of the respondents of a study conducted in India have purchased medicine through online, but 85.8% of respondents were aware about online pharmacy (Sah *et al.*, 2018). In Nigeria, the awareness level of consumers about availability of online pharmacy services is less than a third of the respondents in this particular survey (Ndem *et al.*, 2019). However, the above figures have changed drastically in post covid era (Mouratidis and Papagiannakis, 2021). According to Bowman et al. (2019), the internet is an unregulated gateway to pharmaceutical business. There is an higher probability of misuse by many ill-intentioned individuals who may profit from vulnerable people (Samant and Deshpande, 2018). Therefore, the researcher identified that the consumer purchase behaviour towards online pharmacy is under dismay in many developing counties like India (Sabbir, Islam and Das, 2020) which is examined in this study.

In the wake of COVID-19, internet penetration and technological literacy, Indian consumers are found as inclined to purchasemedicines via online portals (Sah *et al.*, 2018). Primarily, these online pharmacy portals establish an easy opportunity to purchase large variety of medicines, such as nutraceuticals, generic over-the-counter medications (OTC) and prescription-only medicines. Internet- based pharmacies are known as online pharmacies or e-pharmacies or cyber pharmacies (Henney *et al.*, 1999). In Indian e-pharmacy segment, there are online subdivisions of conventional community pharmacies, independent internet-only websites/ smart phone apps, social media apps and websites representing partnership among traditional pharmacy shops are considered under the purview of online pharmacies (Fung et al., 2004; Sah et al., 2018) which is adapted in this research article. Further to this, the research about online purchase of medicines have generalized the term 'medicines' to include all types of medicines, vitamins and dietary supplements (Ndem *et al.*, 2019). In this study, the researchers define that the online pharmacies are internet-based vendors of pharmaceutical products and health-related goods and services, using supply chain system.

Theoretical Foundation and Hypothesis Development

Risk Perception towards Online Pharmacy

Despite the various advantages offered by online pharmacy, they pose a huge health care risk to consumers (Fung et al., 2004). Due to the fact that these virtual pharmacies are apparently unregulated market (Levaggi *et al.*, 2009), the World Health Organization (WHO) warned as well emphasized that supply of counterfeit/spurious medicines through online pharmacies pose a significant public health risk (Word Health Organization, 2011). Apart from the internal threats, online pharmacy is posing invisible or unseen risks through external websites operating from abroad. These are marked as risk characteristics of fraud or illegal online pharmacies (Bowman *et al.*, 2020). Most of the studies on e-pharmacy denote that the risk involved in this online business is critical factor in its adoption (Baldacchino & Adami, 2016). Taking into account, indeed, safety was the main reason for not purchasing medicines online (Bowman *et al.*, 2020) which does not mean that one should avoid internet purchasing of medicines. Besides, it was difficult to decide if the source was reliable and the product quality is also under question (Bowman et al., 2019; Lee et al., 2017; Fung et al., 2004). In this regard, customers' risk perception towards online pharmacy is explored in order to assess the current situation of acquiring drugs from Internet and its influence on medical product use and drug safety through a questionnaire survey (Pál et al., 2015).

Based on the empirical studies, there are a few varied approaches towards the perception of risk in accordance with offline and online perspectives (Forsythe and Shi, 2003). The theory of consumers' perceived risk as proposed by R. A. Bauer, the consumers face uncertainty and potentially undesirable consequences as a result of purchase(Taylor, 1974; Dowling & Staelin, 1994). After Bauer (1960) who proposed first that consumer behaviour is associated with risk taking attitude, valuable empirical research have attempted to identify various types of perceived risk in the context of the consumer's purchase behavior. According to Mitchell, "consumers are more often motivated to avoid mistakes than to maximize utility in purchasing"(Mitchell, 1999). Accordingly, it is widely investigated that various influences of perceived risk such as customer demographics, consumer awareness, experience in using the internet, product/service features, and Website attributes which are found correlated with risk perception (Naiyi, 2004 ; Ariffin et al., 2020).

Literature suggested that consumer's attitudes and willingness are influenced by the risk perception for online purchasing (Crespo, Del Bosque and De Los Salmones Sanchez, 2009). Consumers are unableto foresee the consequences of their purchases (Abzakh, Ling and Alkilani, 2013). The nature and dimensions are varied or differed from one another according to traditional literature on risk perception, as well from the empirical evidence obtained by various e-commerce context (Park et al., 2014). Invariably, the studies reveal that the risk emanates from the overall process of B2C (Zhang et al., 2011). Risk derives from various aspects of purchase process (Yang, Sarathy and Lee, 2016). Therefore, many scholars have researched perceived risk dimensions and its effects from various perspectives (Masoud, 2013; Dai et al., 2014). Mitchell opined that consumer perceives different levels of risk in the purchasing process at every stage (Mitchell, 1999). Based on the meta-analysis, Zhang et al. (2011) authenticated that there are multiple sources of risk which are having larger impact on consumers' overall risk perception. Anne-Sophie Cases identified the four sources of risk (Cases, 2002). Because, perception of risk on the part of consumers acts as a deterrent to customer purchase intentions(Al-Rawad et al., 2015; Yang et al., 2016), virtual shopping behaviour (Dai, Forsythe and Kwon, 2014), attitude toward usage behavior(Naami et al., 2017; Mortimer et al., 2020) and intention to adopt e-commerce(Lisdayanti *et al.*, 2020). Diverse studies have also obtained empirical evidence that supports the effect of perceived risk on consumer purchasing

behavior. However, perceived risk is often a general perception held as a natural characteristic by many customers (Lisdayanti et al., 2020) and multidimensional concept(Mortimer, 2018; Brosdahl & Almousa, 2013). But many of the studies argue that consumers unconsciously involve in a trade-off between different forms of risk perception. However, many researchers found that these multiple risk dimensions are combined to form certain amount of overall risk perception and is conceptualised as high order unidimensional construct (Featherman & Pavlou, 2003; Zhou et al., 2018).

However, multidimensional approach towards risk perception is widely used in e-commerce discussions to identify their impact on purchase intentions(Cunningham *et al.*, 2005).This helps the marketers to understand the perceived risk determinants and their implications for their strategy design process (Park et al., 2019). According to Park et al. (2014), the risk perceptions are divided intotwo types—behavioural risk and environmental risk; former risk arises out of e-retailer and their opportunistic behaviour and the second one belongs to the unpredictable character of purchasing medium. Literature stated that the dimensionality of perceived risk in an online setting vary and conclude with different classifications in accordance with its particular online applications as per the empirical studies (Verhagen, Meents and Tan, 2006). Based on the above classifications, the researcher incorporated both types of risk into three dimensions of risk perception. Because, consumers generally associate online purchase with a critical risk perception specific to the purchase medium. Accordingly, consumers have fear of their financial information or credentials being hacked or misused in online transactions(Van *et al.*, 2020). This risk perception is treated, in this study, as financial risk perception which is common across all product categories. Financial risk is defined as the risk perception of a consumer towards the potential monetary loss due to wrong transaction or bank account misuse. The other dimension of risk,used in this study, is physical risk which is associated with the issues like the inability to physically inspect products when the information about the product is known little or lack of content knowledge in evaluating the brands and alternative products. This type of risk vary across product categories and its impact is high in the case of medicaments (Svorc, 2012; Park et al., 2019), because it causes threat to human life.Physical risk is described as the probability that a purchased product (medicines) results in a threat to human life. Other than these two risk dimensions (financial risk and physical risk), the online pharmacy poses a critical risk dimension with regard to its source(Ashames *et al.*, 2019). Dharmesti et al. (2019) pointed out that the recent technological innovations are advanced with risk avoidance mechanisms to protect the interest of the online consumers through various protocols like third party assurance and money back guarantee schemes and money return policies. However, studies on e-pharmacy revealed that the degree to which a consumer identify the source risk perception towards is comparatively high and different. (Srivastava and Raina, 2020). Source risk is described as the credibility or reliability concerns over the source of supply or purchase; e-pharmacy vendors(Mohamed, Hassan and Spencer, 2011).Amirtha et al. (2021)defined source risk as concern over whether the prospective online consumer can trust the e-vendor and feel satisfied in doing business. Many of these risk perceptions are studied from a technological point of view as that of impersonal characteristics of online environment. This study is differentiated with the previous studies as it studies the belief variables like dimensions of risk perception and online trust towards the online purchase intention of medicines.

In the case of technology enabled products like e-pharmacy, users may perceive a technology as being advanced, but they shall not adopt it (Cao & Niu, 2019). E-pharmacy is nascent stage in India , facing the same reality both as innovative product and critical for human life.Therefore, this study is justified because of its specific product category of e-commerce (medicines)and its context

(emerging markets).In short,risk perception is associated with various level of the aforementioned situations and is identified with e-transaction errors, causing monetary losses, defective products due to wrong choice of medicines, and reliability concerns over the source of supply about the authenticity of the e-pharmacyvendors, possibility of counterfeit medicines. However, its impacts on purchase intention is differed based on its interactive factors (Kaur and Arora, 2021).

Online Purchase Intention towards E- pharmacy

Online purchase intention is an important constituent of consumer behaviour. Consumer Behaviour is the processes in which an individual selects, purchases, uses or disposes of products, services, ideas, or experiences to satisfy his/her needs and desires (Solomon, 2004). Many researches have widely discussed; what motivates consumers to shop online (Dharmesti *et al.*, 2019), impact of shopping benefits and risks (Bhatnagar & Ghose, 2004), benefitsof online shopping (Sener, Atesoglu and Coskun, 2018), product types that affect online consumption decisions (Eggert, 2006), website design (Bashir & Madhavaiah, 2015), personal perceived values (Escobar-Rodríguez and Bonsón-Fernández, 2017), security and privacy (Tsai and Yeh, 2010). Summing up these factors, (Zhou et al., 2007) formulated a theme based on belief(Kim et al., 2008)-intention-behavior causality (TRA)which validly proven in the e-commerce environment(Nguyen and Cassidy, 2018).

The consumers' buying behaviour has been extensively studied and debated over the decades based on various factors and outcomes (Constantinides, 2004). Considering the e-commerce context, online purchase intention is defined as a psychological disposition of predicting consumer purchase behaviour towards finalizing a negotiation using the internet (Mainardes et al., 2019). Ajzen(1985) described purchase intention as individual's readiness and willingness to purchase a certain product or service. McKnight et al. (2002) asserted that consumer behaviour intentions referto a consumer will likely behave in a specified way. It is understood that both purchase intentions and actual behaviours are mostly inseparable and very highly correlated. In this study, online purchase intention is defined as the intention of an online consumer to engage in specific behaviour, going beyond the willingness to involve in specific act of purchase of goods or services from an e-vendor(McKnight et al., 2002).Taking into consideration the above empirical studies, purchase intention can be a reliable predictor of buying behaviour(Bashir et al., 2019).

Health care products are of great concern among online customers due to its impact on wellbeing of its consumers. With regard to purchasing medicines through online, consumers potentially put themselves at risk (Alwon *et al.*, 2015). In the case of varied risk perception in e-commerce, researchers describe those products based on product classification such as 'low or high product involvement' in which the level of consumers' personal relationship with purchasing a particular product actin term of theirperceived importance of value or risk (Al-Gasawneh *et al.*, 2020). Therefore researchers and practitioners unanimously agree that demographic, social, economic, cultural, and psychological factors are largely beyond the control and have a major effect on consumer behavior and purchasing decisions (Constantinides, 2004)**.**

The empirical evidences that support the effectof perceived risk on e-consumers' purchasing intention is widely evaluated on different and diverse contexts.Wei et al. (2018)demonstrated that the perceived risk has no significant effect on consumer's purchasing intention. Ventre & Kolbe (2020)found that risk perception does not influence directly the online purchase intention. On the other hand, most studies on e-commerce affirm that risk dimensions are important antecedents of purchase intentions (Kim et al., 2017). It is assumed that the more risk consumers perceive, the less likely they will make a purchase. In other words, the risk perception is negatively related to

purchase intention (Zhang et al., 2011). Perceived risk is described as one of the main barriers in the development of e-commerce due to the specific characteristics of emerging markets (Van *et al.*, 2020). And the relationship between risk perception and purchase intention is varied according to its intervening mechanisms in their decision-making process and buying behaviour(Ha, 2020). Particularly, in an online environment, tangibility or physical experience is absent. Therefore, the risk perception is observed as a natural characteristic of an online consumer.In spite of the recent and marked interest, previous studies have mainly been concerned with technology focused market segmentations and generic customer buying behaviour. Therefore, the impact of risk dimensions on consumer's purchase intention obviously depends on the interactive factors that make the measurement difficult under different circumstances (Ariffin et al., 2018). Since, the context of this study is online purchase of medicines, consumers' risk perception as well as its various dimensions towards purchase intention of non-adopters add further research orientation. Therefore, this study is vital in forecasting purchase intention in e-pharmacy adoption process in an emergent country like India. Based on the above discussion, it is hypothesised that

H1: There is a negative relationship between Financial Risk and Online Purchase Intention of E-pharmacy

H2: There is a negative relationship between Physical Risk and Online Purchase Intention of E-pharmacy

H3: There is a negative relationship between Source Risk and Online Purchase Intention of E-pharmacy

Online Trust (OT) towards E-Pharmacy

Online trust is a novel term used in the online environment to describe online consumers' intentions to transact with unfamiliar or new e-vendors. Online trust is a strategic imperative for internet-based vendors because it allows e-consumers to overcome perceptions of risk and uncertainty. And it is a psychological factor through which aconsumer determines the nature of interaction or governance mechanism in the exchange processes over internet (Alharbi *et al.*, 2020).According to Ling et al. (2010), online trust is e-customers' willingness to accept any failures in an online transaction along with their positive expectations regarding successful future online behaviour. Trust can endorse huge impact on the intention to purchase product and able to enhance behaviour towards purchasing products online(Van *et al.*, 2020). In e-commerce, trust is at the heart of the relationship between e-vendors and e-consumers (Nam, Cho and Kim, 2021). The notion of trust assumes different perception based on its functional role in an exchange activity or transactions. Nam et al. (2021) stated that customer's trust involves their attitudes (beliefs and perceptions) and expectations concerning the risk involved and their vulnerability in online shopping experience (Zheng, Lee and Cheung, 2017). Trust can encourage e-consumers' purchase activities and their decision-making process. It can minimize e-consumers' uncertainty about products too and, in turn, leads to affect e-consumers' attitudes toward purchasing intention (Alharbi *et al.*, 2020).

Trust is characterized by uncertainty, vulnerability or dependence (Jarvenpaa, Tractinsky and Vitale, 2000). According to the Wagner et al. (2020), online shopping necessitates customer trust. It is argued that sufficient degree of trust is required when an e-consumer places an order online, while submitting their financial information and other personal data in e-medium. Online trust is a belief that the e-vendor can be trusted and a feeling of confidence and security towards such particular e-transactions (Sahney, Ghosh and Shrivastava, 2013). It is observed that trust is an important determinant of online business. Because, trust or lack off it, can create a vital

physiological barrier for e-consumers to try or not to adopt new technologies and online shopping behavior(Hansen, Saridakis and Benson, 2018). Prior literature stated that consumers often hesitate to interact with online vendors because of uncertainty or the risk perception about the vendor's behaviour (Constantinides, 2004). In this process, trust is a critical aspect of online shopping (Gefen, 2000).Ling et al. (2010)concluded that higher the degrees of e-consumers' trust, the higher degree of purchase intentions of e-consumers. However, it is identified that the moderating effect of online trust on purchase intention is scarcely integrated in online pharmacy segment. Thispaper addresses this gap by adopting an integrative approach to understand the impact of risk perception and by explaining the moderating effect of online trust on online purchase intention.Interestingly, it is found that various studies on online trust have been developed in western economies than in emergent countries like India which is unique contribution of this study.

The growth of e-commerce affirms that consumers are tend to be more receptive and open to a technology-related service when they can control the use of the technology. However, on the other hand, Park et al. (2019) observed that consumers are suspicious about whether the system will work satisfactorily, accurately, and reliably in every online environment. Literature suggested that the two types of risk as discussed earlier (behavioural and environmental) are similar to the two dimensions of trust regarding e-commerce ; Truston either the technology or the provider (e-vendor) (Siau and Shen, 2003). Though they are found related, its impact is varied on both variables, and depend on various other factors(Kaur and Arora, 2021). Perceived risk can be affected or moderated by a variety of factors (Zhou et al., 2007).

This study has adapted online trust for testing its moderating effect in this research model. Because, trust facilitates usefulness or other factors by reducing the risk perception in online buying process. Therefore, trust is included as a moderator. It is evident that those who perceive high risk in any transaction will be reluctant to engage in any sort of relationship. On the other hand, those who have high degree of trust in any transaction that will outweigh the risk involved too (Harridge-March, 2006). Indeed, this can be the same in the case of online pharmacy.Because in the e-pharmacy, as adopted in this study, e-consumers are uncertain about the key area of interaction such as the possibility of receiving wrong medicines and potential danger of ordering the medicines through fake e-vendors and can be a source of anxiety. In that case, e-consumers will do e-transaction only if they perceive a high level of trust in it as trust moderates the online purchase intention of non-adopters of online pharmacy(Kaur and Arora, 2021).Wei et al. (2018) admitted that the increased trust in the online environment was an effective way of promoting online purchase too. Therefore, in the absence of concrete model about these moderating effects in e-pharmacy, it is hypothesised that

H4: Trust positively moderates the relationship between Financial Risk and Online Purchase Intention of E-pharmacy

H5: Trust positively moderates the relationship between Physical Risk and Online Purchase Intention of E-pharmacy

H6: Trust positively moderates the relationship between Source Risk and Online Purchase Intention of E-pharmacy

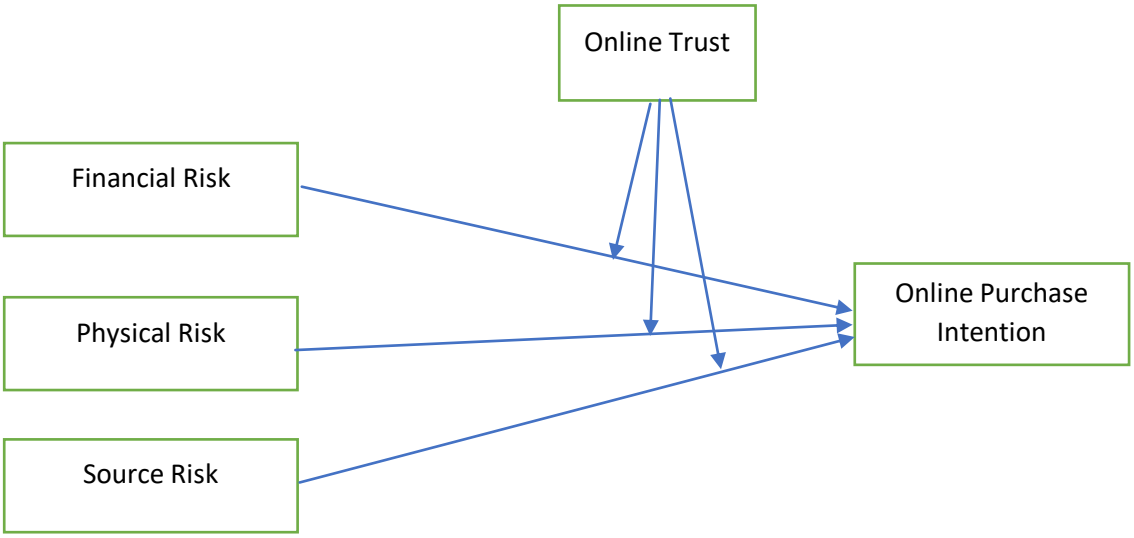

Figure1: Proposed Conceptual Framework of the study

Research Methodology

Overview of sample and Procedures

The population of this descriptive and explanatory study composed of online consumers in India who haven't purchased medicines through an online pharmacy. The perceptions of online consumers towards online pharmacies are measured using self-reporting questionnaires. Since all constructs are self-reported, Harman's Single Factor test is conducted to check the common method bias. When the measurement items are loaded into a single factor, it is found that the total variance explained by the single factor alone is 28.901% which is below the threshold value of 50%, thus confirming no indications of common method bias.

Out of 900 questionnaires distributed, 800 were received back and after eliminating the incomplete questionnaire, 740 samples were selected for final data analysis. The sample comprised 39.3% male (291) and 60.7 % female (449) and a majority of respondents (53.9%) had a post-graduate-level educational qualification. 64.6% of the respondents (478) were in the age group of fewer than 30 years, 23.9% were in the age group of 30-45 years (177), and the rest of them were aged above 45 years. Regarding online purchasing behavior of respondents, 83 respondents (11.2%) frequently buy online products, 169 are regular buyers (22.8%), 365 are occasional buyers (49.3%), and the rest go online shopping rarely.

Measures

The researchers have adapted the existing and well-tested scales for measuring the independent variables (Financial Risk, Physical Risk, and Source Risk), Moderating variable (Online Trust), and dependent variable (Online Purchase Intention).

The current study conceptualized the multidimensional concept of Perceived Risk and each dimension was taken as a single-order construct. The financial risk was measured using a 7-item scale developed by Forsythe et al. (2006) and the scale had adequate reliability (α=0.887). The

sample items included “I may not get the product that I have paid for in online pharmacy” and “My Credit/ Debit card number may not be secure with online pharmacy”. Physical risk was measured using 3 – item scale developed by Forsythe et al. (2006). The scale had adequate reliability (α=0.904) with sample items “I am concerned purchasing medicines through online pharmacy will endanger my health” and “I am concerned about potential physical risks associated with the consumption of medicines that I purchase through online pharmacy”. Source Risk was measured using 6-item scale adapted from Mohamedet al.(2011). The scale had adequate reliability (α=0.905) with sample items “It is difficult to ascertain the reliability and expertise of some online pharmacies” and “It is difficult to ascertain the reputation of some online Pharmacies”.

Online Trust was measured using 7- item scale adapted from (Ganguly et al., 2010) and the scale had adequate reliability (α=0.905). Sample items included “I do believe that the transaction through online pharmacy store is always safe” and “I do believe that the transaction through online pharmacy store is always reliable”. Online Purchase Intention was measured using the 5-item scale adapted from Bashir and Madhavaiah (2015). The scale has adequate reliability(α=0.915) and the sample items included "I intend to purchase medicines over Internet in the future" and “I will add Internet pharmacy to my favorite links" (α=0.918).

Results

The data analysis is performed using IBM SPSS 23.0 and AMOS 24. Table 1 provides mean, standard deviation, and other descriptive statistics of variables under the study. Preliminary checks for normality are performed and all constructs fall within the acceptable values of kurtosis and skewness (+/-1.5) (Hair et al., 2010). Multicollinearity is tested using VIF factor statistics. The values of VIF are below the threshold limit of 3, which indicated no multicollinearity issue among the constructs. Also all constructs under the study have significant correlation with each other.

Table 1: Mean, Standard Deviation, Convergent validity and discriminant validity

	Mean	SD	CR	AVE	OT	FR	PR	SR	OPI
OT	3.1581	.67114	0.901	0.567	**0.753**				
FR	3.0946	.77108	0.876	0.503	-0.053	**0.709**			
PR	3.2374	.88978	0.901	0.752	-0.092	0.624	**0.867**		
SR	3.7517	.72628	0.903	0.701	-0.176	0.459	0.458	**0.837**	
OPI	3.3414	.75285	0.905	0.658	0.538	-0.123	-0.183	-0.174	**0.811**

Note: *The values on the diagonal (in bold italics) represent the sq. the root of average variance extracted (AVE) for each factor, while the variables below the diagonal represent the correlations between each pair of factors*

Measurement Model Testing

Confirmatory factor analysis using IBM AMOS 24.0 was conducted to validate the factor structure of variables under the focus of this study. The hypothesized five-factor measurement model had a satisfactory fit ($\chi 2$ /df = 3.736.; RMR = 0.032, CFI = 0.936, AGFI = 0.875; RMSEA = 0.061). The composite reliability (CR) values of all constructs in the study were above 0.80 (Table 1), which

confirmed good reliability of the measurement scale. The average variance extracted (AVE) for each construct was above 0.50, ensuring convergent validity (Fornell and Larcker, 1981). The Square root of AVE greater than inter-construct correlations authenticated the discriminant validity of the measurement tool. Overall, there is satisfactory support for the proposed theoretical model, which permits us to advance with hypotheses testing.

Hypotheses Testing

The proposed hypotheses were tested using IBM SPSS 23. Table 2 shows the results of the direct hypotheses. Results revealed that there is a significant negative relationship between Financial Risk and Online Purchase intention (β= -0.138, p<0.001), thus supporting Hypothesis1. Also, Hypothesis 2 was supported, as there was a significant direct effect of Physical Risk on Online Purchase Intention (β = - 0.203, p<0.001). The results also revealed that Source Risk had a direct effect on Online Purchase Intention (β= -0.138, p<0.001), thus supporting Hypothesis 3.

Table 2: Direct Hypotheses Testing

Direct Hypothesis	Estimate	t-statistic	p-value	Remarks
FR -OPI	-.138	-3.787	.000	Significant
PR -OPI	-.203	-5.625	.000	Significant
SR -OPI	-.134	-3.686	.000	Significant

Model 1 of Hayes PROCESS macro, using the bootstrapping procedure at a 95% confidence interval, was used to test the moderating effect of Online trust in the relationship between independent variables and dependent variable. In the bootstrapping procedure analysis, if the upper and lower bounds of the 95% bias-corrected CIs do not include zero, the interaction effect is considered to be significant. Results from the moderation model (Model 1) analysis (Table 3) indicates that Online Trust positively moderates the relationship between Financial risk and Online Purchase intention, as the 95% bootstrap confidence interval of the interaction effect (0.0744) does not include zero (LLCI =0.5882, ULCI= 0.0436), thus supporting H4. Also, Online Trust positively moderates the relationship between Physical risk and Online Purchase intention, as the 95% bootstrap confidence interval of the interaction effect (0.0820) does not include zero (LLCI =0.0201, ULCI= 0.1440), thus supporting H5. Results revealed that Online Trust does not moderate the effect of Source risk on Online Purchase Intention, as the 95% bootstrap confidence interval of the interaction effect (0.0058) straddles zero, thus H6 is not accepted.

Table 3 : Moderation Hypotheses Testing

Interaction term	Estimate	se	t	p	LLCI	ULCI	Remark
FR*OT - OPI	.0744	.0373	1.9556	.0067	.5882	.0947	Moderation
PR*OT- OPI	.0820	.0326	2.5597	.0095	.0201	.1440	Moderation
SR*OT- OPI	.0058	.0322	0.1308	.8960	-.0807	.0923	No moderation

Further, to better understand the interaction pattern between different risks and Online Purchase Intention at different levels of trust, an interaction plot is formed by computing one standard deviation above and one standard deviation below the mean of online trust (Kaur and Arora 2020). Figure 2 depicts the relationship between Financial risk and OPI towards e- pharmacy under high and low levels of trust. Examination of the interaction plot showed Financial risk coupled with online trust exerts a strong impact on OPI at low level of trust. In other words online trust dampens the negative relationship between Financial risk and OPI at lower level of trust but the moderation effect is found insignificant at high level of trust.

Table 4: Conditional effect of Financial Risk on Online Purchase Intention at different levels of Online Trust

ONLTRU	Effect	se	t	p	LLCI	ULCI
2.4870	-.1565	. 0426	-3.6776	.0003	-.2401	-.0730
3.1581	-.1066	.0313	-3.4026	.0007	-.1681	-.0451
3.8292	-.0567	.0375	-1.5136	.1306	-.1302	.0168

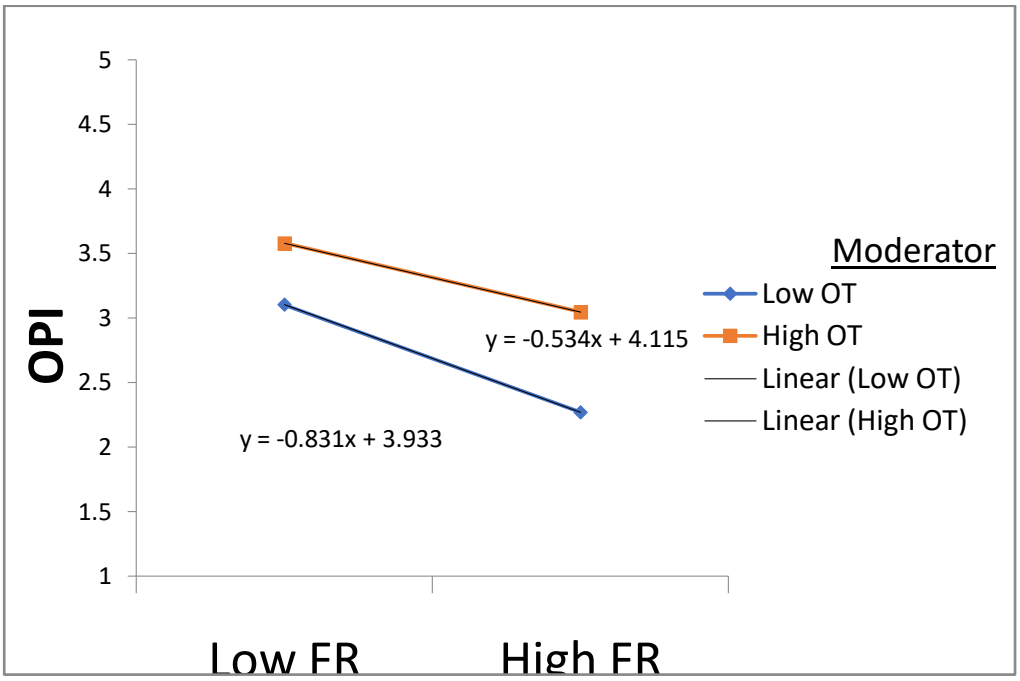

Figure 2 : Interaction plot – Financial risk & Online Purchase Intention

Figure 3 depicts the relationship between Physical risk and OPI towards e- pharmacy under high (3.8292) and low levels (3.8292) of trust. Examination of the interaction plot showed that at lower level of trust, the negative effect of Physical risk on Purchase intention is higher (-0.1978) when compared to higher level of trust in online pharmacy(-0.0743). This implies that the negative relationship between Physical risk and OPI towards e-pharmacy is weaker among the customers with high trust (-.0743) than those with low Online trust (-.1978). In other words Online trust dampens the relationship between Physical risk and Online Purchase Intention. The moderation effect is found significant at all levels of online trust.

Table 5 : Conditional effect of Physical Risk on Online Purchase Intention at different levels of Online trust

ONLTRU	Effect	se	t	p	LLCI	ULCI
2.4870	-.1978	.0369	-5.3606	.0000	-.2703	-.1254
3.1581	-.1361	.0269	-5.0653	.0000	-.1888	-.0833
3.8292	-.0743	.0322	-2.3063	.0214	-.1376	-.0111

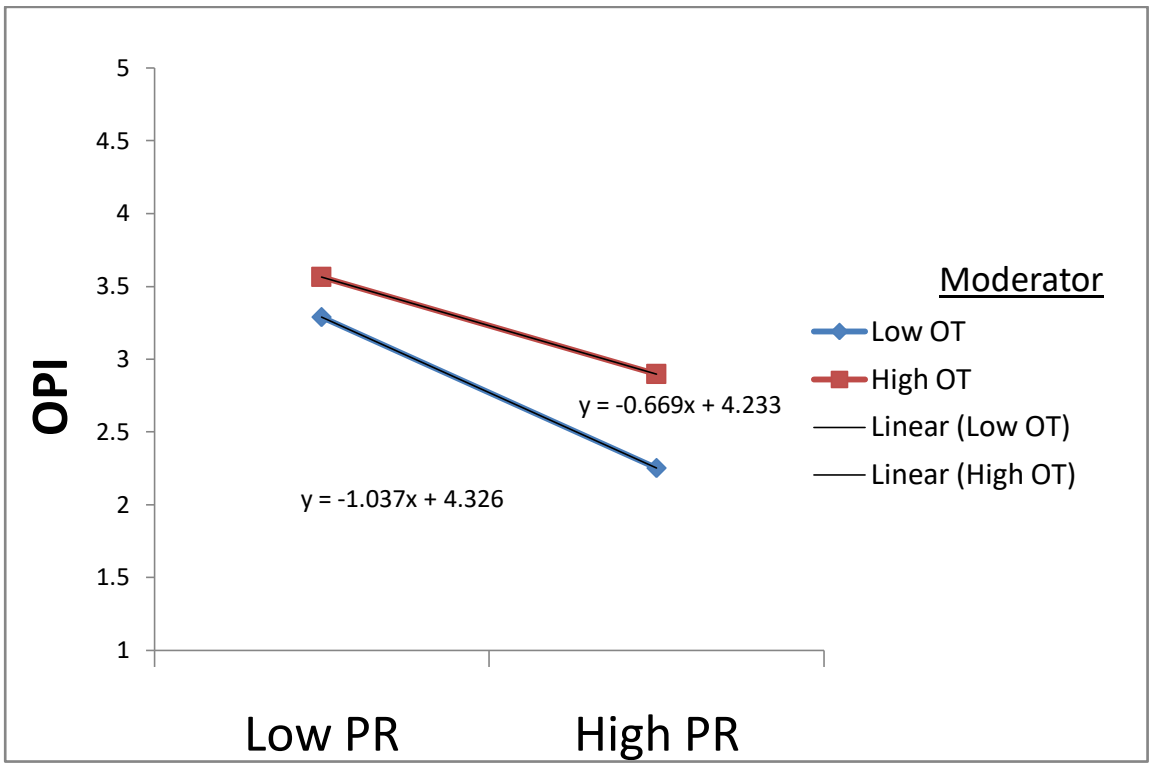

Figure 3: Interaction plot: Physical risk and Online Purchase Intention

Discussion

There are many serious issues that affects online shopping behaviour in India. Among which risk perception stands out a hindrance to shop online. Because, an online consumer sees potentialrisk in the purchase ofmedicines due to the uncertainty about the outcome of their decision, or concern about its consequences. In line with the literature, the results of the present study also indicate that perceived risk has significant impact on OPI among non-adopters of e-pharmacy in India. Previous studies have clearly stated the negative influence of risk perception on online purchase intention(Cox & Rich, 1964;Lăzăroiu et al., 2020). Furthermore, this impact is debated over the various contexts, primarily in offline and online environments. Regardingthe online pharmacy, the present research established the relation between the dimensions of risk perception and purchase intention towards e-pharmacy which is contrary to the finding of Arora & Rahul (2018)and particularly, the study focused on understanding the underlying mechanism (OT) through which risk perceptions impact online purchase intention. Indeed, pursuing the literature, both risk-intention

direct relationship and the effect of interaction mechanism (moderated relationship through OT) had been overlooked in the case of e-pharmacy.To fill this gap in existing literature, this study found both the direct and indirect effect of online risk across different dimensions of RP (financial, physical, source), on purchase intention, through online trust too.

The study confirmed the influencing both negative and positive factors of online shopping behaviours towards e-pharmacy. And the results of this study enriches the understanding of three dimensions of risk perception, FR, PR, SR, among the online consumers towards e-pharmacy. Besides, there is limited empirical work in Indian context which simultaneously addresses the success factors (positive factors) and resistance factors (negative factors) that help online consumers to adopt online pharmacy. This study captures the limitations of the existing literature by investigating the effect of trust, dimensions of perceived risk on online purchase intention from the consumers' perspective in the context of online pharmacy. Thus, it integrated the theory of risk perception (TRP) and social exchange theory (SET). Accordingly, it is found that in an online transaction, the exchange parties (buyer and seller) evaluate their relationships in a behavioural context and look beyond short-run inequities or risks which is explained from a socio-political perspective through Social Exchange Theory (SET) (Chen et al., 2015). Based on the above, this study adapted the prior conceptualization of trust (Mayer, Davis and Schoorman, 1995) to define online consumers' trust in e-vendors as 'the willingness of buyers to accept vulnerability on the basis of positive expectations of sellers' credibility'. This is in line with the view ofPavlou & Gefen (2004). And the concept of perceived risk is adapted fromJarvenpaa et al. (2000) and Pavlou& Gefen (2004) to this particular research context and defined it as online consumers' belief that a loss could possibly occur as a result of online vendors' fraudulent activities.

Upon the given data analysis, the findings support the following details. The study revealed that the dimensions of risk perception; financial risk, physical risk, and source risk, have significant negative relationship with consumers' online purchase intention towards e-pharmacy. The previous studies and meta-analysis have found the same with regard to the directions of theserelationships (negative effect) towards online purchase intention (OPI) (Amirtha, Sivakumar and Hwang, 2021). The financial risk is negatively related to OPI that still the experienced online consumers are more concerned about the possibility of monetary loss. In the moderating mechanism (OT), it is found that the risk perception is diminished to some extent. As the literature supports, the physical risk which is identical with health risk is negatively influences the OPI of e-consumers (Amirtha, Sivakumar and Hwang, 2021). However, the moderating effect of OT can diminish the negative effectof physical risk perception on OPI in e-pharmacy context. In accordance with the finding of Mohamed et al. (2011), source risk negatively related to OPI of e-consumers in India. However, the finding of this study related to the influence of OT on source risk - OPI relationship, which is insignificant, is similar to the study of Amirtha et al. (2021). It is inferred that with regard to the online purchase of medicines, the e-consumers are more cautious about its source (reliability of e-vendors) due the detrimental nature of the product compared to other product category. Because,medicines are critical for human life and its availability both online and offline, legal, and illegal are unidentifiable especially in online segment(Koenraadt & Ven, 2018). Therefore,the empirical study on source risk towards online purchase of medicines has attracted the academic interest to distinguish its impact on online purchase intention in e-pharmacy.In general, this study asserted that the dimensions of risk perception have significant direct effect on OPI towards e-pharmacy.The study has uniquely contributed to the literature on e-pharmacy stating that though, the negative impact of these three dimensions (FR, PR, SR) on OPI is affirmed, each risk dimensioncan influence OPI differently according to its context and the interaction of other

intervening mechanisms (Amirtha, Sivakumar and Hwang, 2021). These risk dimensions are generally identified as key factors to predict the purchase intentions. The results indicated that the purchase intention towards online pharmacy is adversely affected mainly by the financial, physical and source risks.

The influence of contextual or behaviour factors on risk perception towards e-pharmacy may bring out contradictory result also. It is found that compared with the negative factors of perceived risk, the intention to use e-commerce is primarily and positively affected by other factors(Kim et al., 2017). This can inferred that the positive factors can be important predictor of the intention to use e-commerce which is consistent withthe findings of Featherman & Fuller (2003).Therefore, the researcher applied the trustfactor to examine its moderating effect on online purchase intention towards e-pharmacy. The literature suggested that consumers can have low trust or high trust which varies according to the context of transaction or product or medium of transaction. This study revealed that the online trust has significant moderation effect on the financial risk and physical risk towards online purchase intention. On the other hand, the source risk does not project any significant moderation effect of online trust towards online purchase intention of buying medicines online. This is justifiable that consumers with low trust tend to have cautious or even negative views when faced with uncertain situations. Similarly, consumers with high trust, regardless of risks, tend to lower consumers' uncertainty towards online transactions and make positively enhance their intention to purchase online(Chen et al., 2015).

Theoretical and Managerial Implications

This study postulated two key factors of online shopping behaviour; risk perception and online trust. Because, online purchase of medicinesis deemed to be highly risky due to its websites can be illegal and may deliver illegal, fakeand counterfeit drugs(Jain, Tadvi and Pawar, 2017). And various studies on e-commerce affirms that trust factor or trust related antecedents are to be considered when investigating non-adopters' intention of using e-pharmacy.Unlike any other products available in e-commerce, e-pharmacy pose severe health risk implications than other risk dimensions of risk perception of any e-transactions. Therefore, regulatory authorities of every country as well as world health organization are strategizing to increase the awareness of individuals on counterfeit medicines and the associated public health risks due to the use of e-pharmacy(Fittler *et al.*, 2013). Recently, the number of e-pharmacy services are on rise, especially after covid-19 and with the growth of internet users. In the present study, the moderating variable (online trust) is compatible with the existing variables of risk perception for they are all originated from consumers' perceptions about the e-vendors of e-pharmacies(Ma, 2021). Thus, the present study integratedonline trust into the theoretical framework to address the research gaps on consumer perception and their purchase intentions towards e-pharmacy.

This study was one of the few attempts to explore the impact of perceived risk dimensions on OPI and its influences on OPI through the moderation of OT towards online pharmacy for purchasing of medications.Different form other studies being conducted in developed countries where online trust is examined based on its relationship between risk perception and other influential factors (Ma, 2021), this particular study focused on online trust as moderator in order to avoid the contradictory and confusing findings related to its directional role in the adoption intention buying process in developing country like India in line with the findings of Arora & Rahul (2018).To fill this gap, the researchers proposed an innovative model using constructs (three dimensions) from TRPto explore the constructs for online purchase intention through the moderating mechanism for the purchase on medicines online.With regard to dimensions of risk perceptions, the results confirm OPI is

influenced by risk perceptions. Thus, empirically, the proposed model demonstrated convincing explanatory power in predicting the online purchase intention toward e-pharmacy. In addition, by integrating trust as the moderator to this proposed model, is an attempt to better understand the strength of consumers' online purchase intention in spite of the risk perceptions towards the adoption of e-pharmacy in India. Recently, Srivastava & Raina (2020) studied the determinants of online pharmacy acceptance in India, and Ma (2021) analysed the influential factors in determining the consumers behavioural intention of online medicine purchase in China. Notably, our study complements and extends the findings of those studies by elucidating the direct and significant impacts of risk dimensions (i.e.,FR, PR, SR) on online pharmacy purchase intention which is treated little in the e-pharmacy literature.

The online pharmacies provide various advantages of time, space, and shopping benefits to the consumers. At a managerial level, this empirically supported study will provide insights into the relationship among the various dimensions of risk perception and the online trust toward the purchase intention of e-pharmacy. Unlike the other studies on e-pharmacy, the risk perception is examined from a multidimensional perspective to have deeper understanding toward the OPI of E-Pharmacy. The result indicated that the source risk has insignificant moderating effect of OT on OPI demands further investigation, to examine whether such outcomes remain persistent in the actual usage of online pharmacy. These dimensions of risk perception shall be of immense benefit to policy makers, healthcare professionals and marketers in formulating theiradvertising and marketing strategies as per consumer choice(Sabbir, Islam and Das, 2020).Based on the findings of moderating effect of online trust, the service providers have to gain trust of online consumers withuser friendly navigation interfaces and authentic information through various social media communities. Thus, they can empower the consumer to take informed decisions regarding their medicine purchase.

Conclusion

This research has confirmed that dimensions of consumers' risk perception are main determinants of their intention to purchase medicines online. And the moderating effect of OT in the relationship between risk dimensions and OPI is investigated to understand better the online consumers' adoption process of e-pharmacy.The conceptual model adopted in this study to depict consumers' online purchase intention was appropriate and consistent with the existing theories. However, this study seems incomplete due to the limitations that neither mediation nor moderated mediation on have discussed in this model. In addition, this study has not incorporated TAM variables and other related constructs in this academic praxis of web-enabled innovation business model like e-pharmacy in Indian context. In short, this current research found that consumers' intention to purchase medicines through online portals was associated with the degree of trust and perceived risks. Above all, this study offers two comprehensive models of purchase intentions (Direct and Moderated) and validates the key understanding of consumer purchase intention of medicines through online.

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