

THE ROLE OF TRUST IN PERSONAL INFORMATION DISCLOSURE ON HEALTH-RELATED WEBSITES

Research Paper

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Abstract

E-commerce adoption has been extensive but for some specialized areas it is still in the early stages. One such area is health-related websites where the sensitive issues around the consumer's health exacerbate the similar challenges faced in other areas of e-commerce. Disclosing personal information is necessary to fully utilize such health-related websites but consumer trust is required for this. This research proposes a model of the role of trust in personal information disclosure on health-related websites. This model identifies 10 factors grouped in three categories. The first category is dispositional factors including faith in humanity, trusting stance and privacy concern. The second category is situational factors including reputation and perceived risk. Lastly the third category is institutional factors including the perceived effectiveness of the privacy statement, third party certification, legal and regulation and security infrastructure. Low risk, reputation, effective privacy statement and privacy seals were found to facilitate trust. While institutional factors like the legal framework and regulation have an elevated role to keep the consumer safe in this context, lack of clarity on what they are leads to a weak perception of their value. Trust in the health-related website was found to positively influence the intention to disclose information.

Keywords: Information disclosure, Trust, Health, e-Commerce.

1 Introduction

The Internet environment makes the interaction between individuals impersonal (Pavlou, 2003). Trust plays a very important role between Internet users and websites in such impersonal interaction (Gefen et al., 2003; Pavlou and Gefen, 2004). Given the fact that impersonal interaction on the Internet is full of risk and uncertainty (Schultz, 2007), online trust reduces unease and anxiety facilitating the establishment of relationships among members interacting on the Internet. For B2C e-commerce, online trust in Internet vendors encourages consumers to transact online (Pavlou, 2001, 2003). Compared with trust in offline relationships and organizational management, trust in the Internet environment is much more complex because there is no direct face-to-face interaction (McKnight and Chervany, 2002). Online trust involves not only psychological consideration (Rotter, 1967), but also situational perception and institutional assurance (Pavlou and Gefen, 2004; Yousafzai et al., 2005). Hence, online trust is an interdisciplinary research topic of great importance for e-commerce (McKnight et al., 2002a).

In the research area of online trust, McKnight and Chervany (2000) has proposed an interdisciplinary model which has been applied to many e-commerce contexts: general online buying (Gefen and Straub, 2004), online auction (Pavlou and Gefen, 2004), online banking and digital currencies (Kim and Prabhakar, 2004; Zarifis and Kokkinaki, 2015) as well as technology adoption (McKnight et al., 2011). Online buying behaviours in general have been explored in relation to several situations such as online travelling websites (Jarvenpaa et al., 1999), online book stores (Gefen, 2000) and specific or-

ganizations such as Amazon (Pavlou, 2003). Nevertheless, this trust model and buying behaviour has been limited in the context of health-related websites, which handle more specific and sensitive information than general shopping websites (Bansal et al., 2010).

This study aims to evaluate online trust in the specific context of health-related websites. Health-related websites usually provide health-related information, products and services to online users and consumers (Cain et al., 2000). For example, *MedicineNet* offers news and information about diseases and medication; *Holland & Barrett* is an online retailer of nutrition and health food; *DocMorris* is an online pharmacy selling both prescription and non-prescription drugs. A report in seven European countries shows that more than 70% of Internet users have conducted online activities related to their health (Andreassen et al., 2007). It is obvious that the Internet becomes an increasingly important platform for people seeking to improve their health and wellness. Additionally, new business models combining e-commerce with healthcare are also emerging (Liang et al., 2005). Since online activities on health-related websites involve highly sensitive information, professional knowledge and unfamiliar situations, consumer trust is critical to mitigate the perception of risk and support decision making.

From the perspective of the online health-related websites they will want to reinforce consumer trust in themselves. Since a transaction-based health website is a particularly new business, consumers are relatively unfamiliar to purchasing health products and services online. Online consumers might have a high degree of privacy concern and perception of risk, which will be obstacles for disclosure behaviour and online transaction. Therefore, trust building is an important process for a health-related website, especially when they are new or are entering a new market.

To gain insight into research on consumer behaviour on health-related websites, this research will focus on a specific consumer behaviour: disclosing personal information online. While interaction with health-related websites includes a number of activities such as information seeking, experience exchange and online transaction this study will explore why and how consumers are willing to disclose personal information to health websites during the online transaction process. The most important reason to focus on disclosure behaviour is that information privacy regarding health is highly sensitive and it is the distinguishing characteristic of this specific context (Bansal et al., 2010). It is very challenging for health-related websites to encourage consumers to provide personal data including their health status or their prescription (Liang et al., 2005). As trust is a critical factor for a consumer to decide whether to reveal personal information it is a suitable starting point to shed light on consumer behaviour on health-related websites.

The research question for this work is: What factors influence consumer trust on a health-related website when a consumer is required to disclose personal information during an online transaction process? Firstly, this research aims to explore which factors have an impact on the trusting belief in transactional health-related websites. Trust-related factors are developed from a range of sources such as psychology, sociology, social psychology and e-commerce (McKnight and Chervany, 2000). We will explore the influence of these factors in the situation of transaction-based health websites such as an online pharmacy. Secondly, this research aims to prove the relationship between trusting belief and the individual's intention to disclose personal information. Will a strong trusting belief facilitate intention in the context of an online transaction on health websites? Will a positive trusting belief encourage consumers to disclose personal data and even sensitive information? These insights will make a model of these issues possible. McKnight and Chervany (2000) have developed an interdisciplinary model of trust, which has been widely validated in many e-commerce situations (Schultz, 2007; Yousafzai et al., 2005). We will enrich and extend this model based on findings from the research on disclosure behaviour and health-related websites. Thus, the underlying research question is whether McKnight and Chervany's (2000) typology and framework is able to explain online trust in the context of health-related websites.

The following section outlines the theoretic foundation and how the model was developed. The third section is the research methodology that describes how the face to face focus groups, template analy-

sis, online survey and structural equation modelling (SEM) were implemented. This is followed by the results and discussion. Lastly the conclusion gives an overview of the most important findings.

2 Theoretic Foundation

In order to develop a research model of trust in the context of disclosing personal information on health-related websites, a literature review of personal information disclosure and the behavioural perspective and models of health-related websites was implemented. The literature was separated into the dispositional trust, situational characteristics of health-related websites and institutional structure of health-related websites. These three categories offered the necessary focus to deduce 11 hypotheses and a research model.

2.1 Dispositional view: General disposition to trust

The first three hypotheses are based on trust. Dispositional trust as proposed by McKnight and Chervany (2000) can be applied to online health consumers, because it explains the trust-building process. Dispositional trust is a belief, propensity or trait deeply rooted in one's personality that one has a consistent willingness to trust others in general situations (Grabner-Kraeuter, 2002). Dispositional trust involves two sub-constructs: *faith in humanity* and *trusting stance*. *Faith in humanity* refers to a basic assumption on other individuals, assuming whether human beings are generally dependable or not (Schultz, 2007). It is therefore hypothesised:

H1: Faith in humanity of online health consumers is positively correlated with their trust belief in health-related websites.

Trusting stance refers to an individual's general strategy in which they tend to trust others because he or she believes that trusting behaviour is a beneficial choice in daily life (McKnight and Chervany, 2000). Individuals with a positive trusting stance believe that a general trusting behaviour generates better outcomes than mistrusting behaviour, no matter what kind of faith in humanity they have (Gefen, 2000; Schultz, 2007). It is therefore hypothesised:

H2: Trusting stance of online health consumers is positively correlated with their trust belief in health-related websites.

In addition to dispositional trust, *privacy concern* has been frequently discussed as a psychological factor that influences online consumer trust, not only in the field of information disclosure (Joinson et al., 2010; Lo, 2010), but also in the research on online health information (Bansal et al., 2010; Fox et al., 2006). Privacy concern reflects a general attitude on privacy security as well as personal disposition toward privacy protection on the Internet (Wakefield, 2013). An online health consumer with a high privacy concern has concerns about loss of information privacy, which negatively impacts on their evaluation of certain Internet situations (Bansal et al., 2010; Malhotra et al., 2004). More specifically, high privacy concern predicts low disposition to trust online health information, and thus weakens trusting belief in online health-related websites. This argument is consistent with the Theory of Reasoned Action (TRA), which claims that the psychological characteristics of individuals have an impact on beliefs (Fishbein and Ajzen, 2010).

H3: The privacy concern of online health consumers is negatively correlated with their trust belief in health-related websites.

2.2 Situational view: Characteristics of Health-Related Websites

The fourth, fifth and sixth hypotheses take a situational view and are related to the characteristics of health-related websites. Compared to other research on trust in general e-commerce situations (Grabner-Kraeuter, 2002; Pavlou, 2003), the current study on consumer trust in health-related websites

embodies more specific situational features. One of the important differences is that health-related websites consist of transactional and non-transactional functionality (Zimmer et al., 2010). There are three business models of health-related websites summarized by Cain et al. (2000): (1) Content, (2) Community and (3) Commerce.

Content-based health websites aim to provide health information and health-related content to Internet users and consumers. Online users and consumers usually search for information about health status, illnesses, treatments and medicines in the content-based health websites (Cain et al., 2000). Some content-based websites (e.g. *DW Healthy Living*, *The National Institutes of Health*) do not require user registration or personal information disclosure, while others request personal log-in or revealing personal data when users would like to search for further information (e.g. *MedicineNet*, *Yahoo Health*). Some research of trust on content-based health websites show that trust significantly improves user satisfaction on websites (Gummerus et al., 2004) as well as the perception of information quality and accuracy (Gagliardi and Jadad, 2002; Hu and Sundar, 2010).

Community-based health websites provide online discussion groups and networks for the health consumer to share and exchange opinions and experience (Cain et al., 2000). In online health communities, members can share their own experience of dealing with a health problem, provide support to other community members (e.g. *WebMD*), or comment and evaluate health products, services or treatment (e.g. *Jameda*). Usually such health community websites require registration and personal data disclosure.

Commerce-based health websites are mainly online vendors which sell health-related products and services, for example, an online pharmacy (e.g. *DocMorris*) or online health service centre. During the transaction process, it is required to provide personal information, such as postal address, bank account and even prescription. Some scholars have proved that trust significantly reduces uncertainty and supports adoption of online prescription filling when consumers purchase medicines online (Liang et al., 2005). Since an online pharmacy is unfamiliar to most online consumers, some online vendors have developed a new business strategy based on *trust transference* to increase consumer trust (Ye, 2011). Trust transference between brands implies the importance of reputation in trust building. Reputation refers to an opinion, attitude or social evaluation which individuals assign to an organization based on second-hand information (McKnight et al., 2002b). It has been proved that reputation has a very strong effect on the process of trust building on health-related websites (Liang et al., 2005; Sillence et al., 2006). Reputation is positively correlated to quality of health-related websites (Arrunada, 2004; Liang et al., 2005). Trust on health-related websites is important because a strong reputation reduces concerns about revealing personal information on the Internet (Eastlick et al., 2006; Metzger, 2006).

H4: Reputation is positively correlated with trust belief in health-related websites.

Another situational factor which is closely correlated with trust on health websites is perceived risks (Bansal et al., 2010; Song and Zahedi, 2007). Perceived risks create the environment where online trust is important (Schultz, 2007), and also partially mediate the effect of trust on intention and behaviour (Pavlou, 2003; Zimmer et al., 2010). Perception of risks derives from two dimensions (Pavlou, 2003): 1) 'distant and impersonal nature of the online environment' and 2) 'uncertainty of using a global open infrastructure', which can be used to explain specific risks on health websites. The first dimension means that the long distance between members on the Internet probably encourages opportunistic behaviours (Dinev and Hart, 2006), such as an illegal exploitation of personal data or online fraud. The second dimension implies that uncertainty in open infrastructure might lead to privacy threats, mostly caused by information invasion from hackers (Hui et al., 2007). In the research on health websites, it is found that perceived risks reduces the trust of online health consumers (Bansal et al., 2010; Song and Zahedi, 2007). Some research suggests that perceived risks directly impacts on behavioural intention (Li et al., 2010), while others argue that the impact is mediated by trust (Dinev

and Hart, 2006; Pavlou, 2003). Hence, the impact of perceived risks on both trust and disclosure intention will be tested, in order to explore whether there is mediating effect:

H5: Perceived risks are negatively correlated with trust belief in health-related websites.

H6: Perceived risks are negatively correlated with intention to disclose personal information on health-related websites.

2.3 Institutional view: Institutional structure of Health-Related Websites

Institutional trust means that individuals believe in one entity based on the perceived effectiveness of the institutional structure e.g. safeguards, legal framework and regulations. Institutional trust is divided into two sub-constructs: 1) *structural assurance* and 2) *situational normality* (McKnight and Chervany, 2002; Pavlou and Gefen, 2004). In the context of health-related websites, structural assurance implies that individuals have a belief that a well-established safeguarding environment with a legal framework, regulation and guarantees will protect them from the risks and uncertainty of these websites (Liang et al., 2005; Song and Zahedi, 2007). Situational normality refers to a favourable process and condition which is familiar to consumers on health-related websites (Liang et al., 2005; Song and Zahedi, 2007). On the two sub-constructs of institutional trust, some previous research has found that only structural assurance has a significant impact on consumer trust in health-related websites (Song and Zahedi, 2007). It can be argued that health-related websites are still a new area for most consumers and typical, commonly favourable processes and norms have not been established (Liang et al., 2005). Structural assurance shows a strong effect because privacy policy, regulation and safeguards are important for consumers who perceive health-related issues to be highly sensitive, especially when disclosing information related to their prescription (Bansal et al., 2010). Thus, online health consumers are likely to trust a website and provide personal data when structural assurance is perceived effective in making a health website reliable and creditable.

In the scenario of information disclosure on health-related websites, the main institutional factors which are perceived to be effective are: (1) privacy statement, (2) third-party certification such as a privacy seal, (3) legal framework and regulation, (4) security infrastructure (Liang et al., 2005; Song and Zahedi, 2007). These factors are consistent with the findings in the general trust research in e-commerce (Pavlou, 2003; Pavlou and Gefen, 2004). A privacy statement is usually a claim posted by a website to describe its privacy policy covering what data are collected from users, why the data is collected, how it is collected, accessed, used and protected (Chellappa and Pavlou, 2002). Some research has indicated that the privacy statement is positively correlated with online trust (Chellappa and Pavlou, 2002; Hui et al., 2007). It is suggested that the privacy statement indicates a strong assurance to protect consumer privacy, which reduces perceived risks of illegal privacy invasion (Hui et al., 2007). Hence, online users are more likely to trust a website with a privacy statement and disclose personal data on that site.

H7: Perceived effectiveness of the privacy statement by online health consumers is positively correlated with their trust belief in health-related websites.

Third-party certification on an entity means a confirmation or verification authorized by an independent organization which assesses whether the targeted entity complies with specific standards (Lee and Turban, 2001; Yousafzai et al., 2005). Typical examples of third-party certification are: TÜV for product safety and quality, TRUSTe for privacy policy compliance, and the EU common logo for online pharmacies. Third-party certification offers reassurance about an organization's compliance with standards. Previous studies have reported that with the presence of third-party seals on privacy policies on a website, Internet users feel more comfortable to reveal personal data (Rifon et al., 2005). Some scholars even argue that a third-party seal is a key success factor in online shopping (Hoffman et al., 1999).

H8: Perceived effectiveness of third-party certification by online health consumers is positively correlated with their trust belief in health-related websites.

The legal framework and regulation refers to a set of rules enforced by authorities to govern, control and direct behaviour of individuals, organizations and systems (Sage, 1999). Zucker (1986) concludes that individuals trust one another because well-established social institutions protect individuals from being harmed or attacked by other persons, not because individuals believe in each other. Therefore, people are more willing to trust in a secure environment with legal and regulatory compliance. As for regulations in online health, the European Medicines Agency of the EU has launched regulations for online pharmacies in 2014. As for Internet privacy protection, the EU has a strong legal framework with *the Data Protection Directive* and *the ePrivacy Directive* ('Protection of personal data - European Commission', 2016).

H9: Perceived effectiveness of the legal framework and regulation by online health consumers is positively correlated with their trust belief in health-related websites.

The security infrastructure of the Internet refers to the technical systems and methods (e.g. encryption) used in the Internet to prevent illegal attacks as well as intrusions in order to protect information privacy (Chellappa and Pavlou, 2002). The perceived effectiveness of the security infrastructure enables online users to lower their perceived risk of information leakage and enhance their trusting belief in privacy protection (Chellappa and Pavlou, 2002). Findings in security infrastructure show that the higher level of Internet security perceived by users the higher their online trust (Chellappa and Pavlou, 2002; Lee and Turban, 2001). On the contrary, a risky and unsecure internet environment, such as an open and vulnerable part of the internet, leads to concerns that hackers might steal personal information and transact the data to illegal organizations. As for information disclosure behaviour, if consumers perceive the security infrastructure to be successfully utilized, they are likely to have very strong trusting beliefs towards Internet safety when revealing sensitive personal data (Wakefield, 2013).

H10: Perceived effectiveness of security infrastructure by online health consumers is positively correlated with their trust belief in health-related websites.

The conceptual model of trust on health-related websites (see Figure 1) is a combination of fundamental trust theories from the general context of e-commerce (McKnight and Chervany, 2002) and specific research on online disclosure behaviour and health-related websites (Bansal et al., 2010; Metzger, 2006). Firstly, this research model is based on McKnight and Chervany's (2000) framework. Dispositional antecedents and institutional antecedents are important sub-constructs of trust belief. Second, an additional dispositional factor, privacy concern, is introduced from the research on information disclosure (Bansal et al., 2010; Eastlick et al., 2006). Privacy concern is a key issue for trust building when websites collect personal information of Internet users. Third, situational factors are introduced from the research in information disclosure and online health (Bansal et al., 2010; Song and Zahedi, 2007). It is found that reputation and perceived risks have a significant effect in the specified situation of health-related websites. Finally, the relationship between trusting belief and trusting intention will be tested. Based on the Theory of Reasoned Action (Fishbein and Ajzen, 2010), belief facilitates intention and thus behaviour. Hence, we hypothesize:

H11: Trust beliefs in health-related websites are positively correlated with trust intention to disclose personal information.

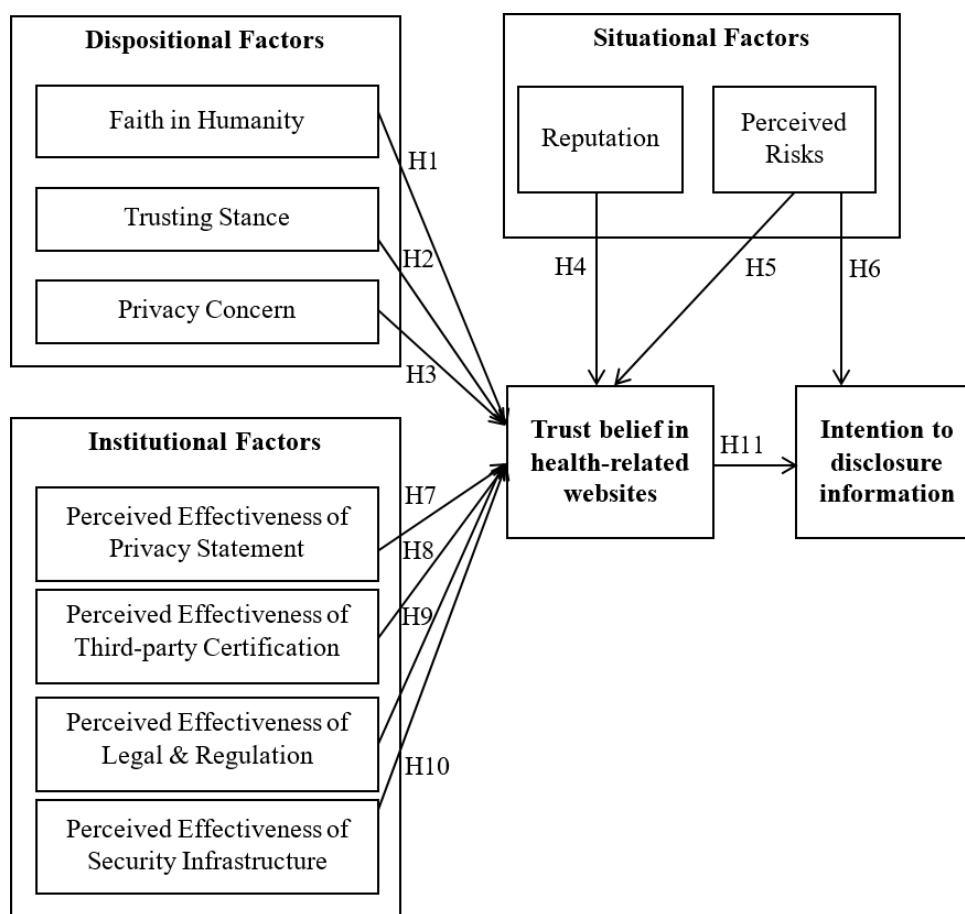


Figure 1. Conceptual model

3 Research Methodology

This research took a critical realist perspective and applied mixed methods with qualitative focus groups and a quantitative survey to validate the model developed. Focus groups were carried out to better understand why participants had the perceptions they had and how these perceptions were formed. Beyond the topics introduced, participants were encouraged to share any beliefs they had on these issues. Initially four focus groups of four to six participants were implemented with a sample from students and alumni. Two additional focus groups of six participants were also implemented with a broader sample that did not target students and alumni. While this method is useful in creating a richer picture of the topic it is better utilized in combination with other methods as it can cause group-think and social desirability bias (Denzin and Yvonna, 2003). Template analysis was used to analyse the transcripts from the focus groups.

The survey was developed based on previous studies and existing scales from related areas. Data collection was conducted online through an online survey tool. Firstly, data was collected over nine days from a sample of students and alumni. There were 155 participants from which 131 had completed the whole survey. Secondly, data was collected over 14 days with a broader sample that did not target students and alumni. There were 251 participants from which 204 had completed the whole survey. The data analysis primarily applied structural equation modelling (SEM) techniques with SPSS and Amos to produce empirical results. Measures for the survey were developed from previous scales in related research. The scales were divided into six sections: 1) sociodemographic information of respondents; 2) dispositional factors; 3) situational factors; 4) institutional factors; 5) trust beliefs and 6) trusting

intention. Pre-tests were conducted with eight university students. The time taken by the participants to complete the pre-test was recorded. After finishing the questionnaire, they were interviewed for feedback about the layout, design, comprehension and clearness of the questions. The online questionnaire was designed with an online survey server SoSci Survey (www.soscisurvey.de).

Structural equation modelling (SEM) is a statistical method to analyse the collected data and test the conceptual model. SEM is a multivariate technique to explore not only correlated links but also causal relationships among variables, particularly among latent variables by integrating mechanisms of factor analysis and multiple regression (Hair, 2010; Raykov and Marcoulides, 2006). Latent variables, which cannot be directly measured but indirectly captured by related observed variables, are very prevailing in research. In this study, for example, gender is an observed variable that can be directly measured while trust belief is a latent variable that is expected to be captured by other items. Compared with the regression method which is appropriate to explore correlated relationships between observed variables, SEM is more useful to test a causal model including latent variables and multiple interrelationships in a simultaneous way. That is why the majority of research in online trust apply SEM to test a proposed model (Bansal et al., 2010; Song and Zahedi, 2007).

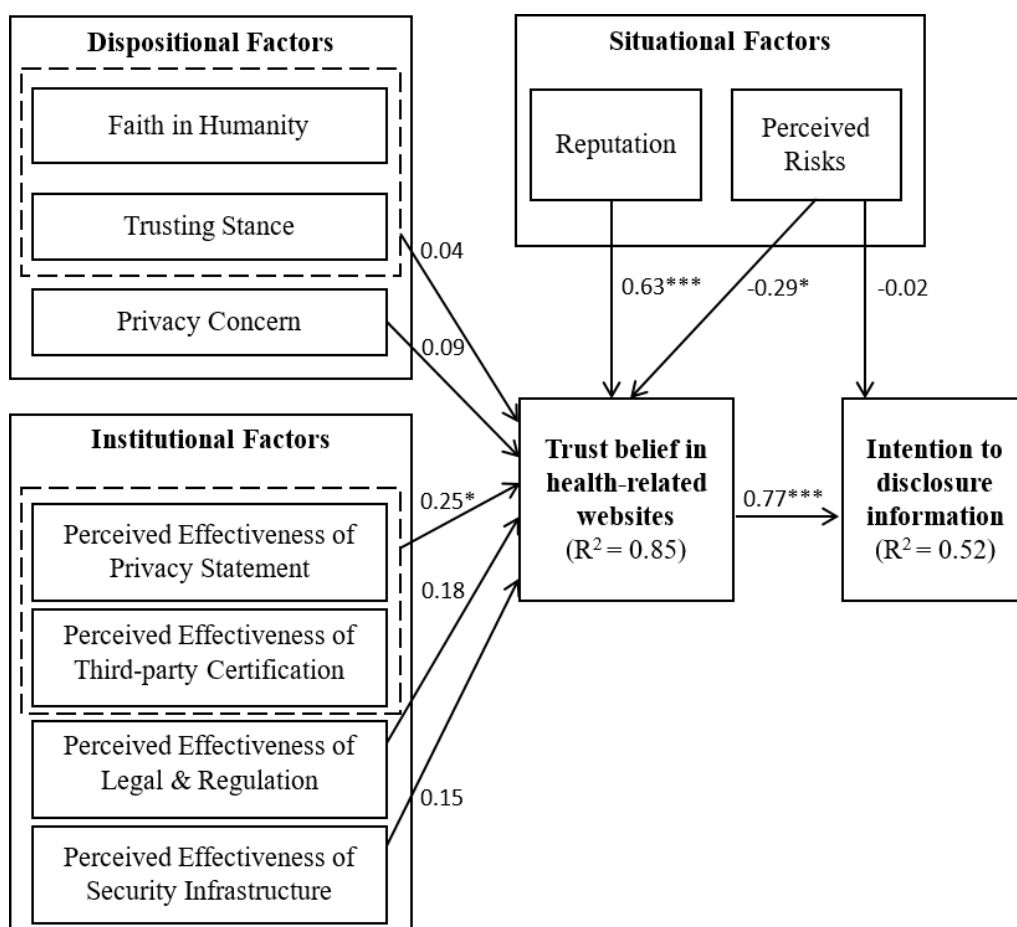
In this research, exploratory factor analysis (EFA), rather than confirmatory factor analysis (CFA) was used to examine construct validity of the survey instrument. EFA and CFA are both methods of factor analysis that discover the underlying relationship and structure of latent variables from measured variables. EFA aims to find how many and what latent variables (latent constructs) can be extracted from measured variables. EFA is often useful for a new model or new constructs for which scholars are not confident of the number of variables and the structure among variables (Hair, 2010). On the other hand, the objective of CFA is to confirm the existing number of and structure among latent variables. CFA is appropriate for an existing model or constructs in which research intends to implement a confirmatory test to see if the measurement is corresponding to constructs (Hair, 2010; Raykov and Marcoulides, 2006). In our research model, some constructs such as faith in humanity and trusting stance have not been extensively validated in this context. The whole model, which is a combination of previous studies, has also not been validated yet. Thus, it is better to use EFA for validity analysis to see if all the proposed constructs can be extracted.

Another reason to use EFA is a statistical consideration. CFA requires three or more items for each latent variable in the scale, while EFA does not. A CFA model for a one-item construct or a two-item construct is hardly identified in most of the algorithms (Byrne, 2010). In our survey scales, some constructs have two items. This is due to the level of maturity of research in this context and the objective of using reputable validated items. Furthermore, having a tolerable length for the questionnaire is an important consideration that favours two item constructs. If there were more than three items for each latent variable (in total 11 variables), the survey would be too long for some participants. Due to these considerations other researchers also used EFA for instrument validation (Pavlou, 2003; Song and Zahedi, 2007). After data screening, SPSS 22 was used for descriptive statistics and EFA measurement model validation and AMOS 22 was used to specify the structural model with SEM techniques.

4 Results

The results from the first and second samples were comparable. The results presented here are from the second sample that was broader and more representative of the target population. The focus groups gave insight into some beliefs on this topic. Firstly, the distinction between health products and other products purchased online was clear. One participant commented ‘...I get clothes online and if they don’t fit me well I return them...if I was sent a different medicine not mine it could harm me...’. A distinction was also made between advice on health and purchasing medicines ‘you go on the sites and they tell you what to eat and what to avoid but you go to a pharmacy for your prescription’. A third point that was commented on extensively was reputation and brand transference ‘I have seen the online pharmacy promoted at my supermarket...if it was promoted by a doctor or a dentist it would

make me trust them more’. Another typical comment on reputation and the nature of trust in the adoption phase was ‘we buy vitamins and health foods online...we didn’t used to so maybe in the future we will get our medicines but it is not something I would do now’. Dispositional factors were covered with some having a general trustworthiness ‘If I can do something on my phone I will, it is easy, I think it is safe’ and less trust ‘when you are sick you want to see a doctor and explain how you feel how do I know a website uses doctors and nurses’. Institutional issues were not often introduced by the participants but when they were there was mostly agreement on the important role they should play ‘I cannot check what a website selling medicine is doing, they might be in another town or another country, the government should check’. The focus groups had a wide range of opinions on most of the topics which indicates the low level of maturity of this form of e-commerce. The explanations as to why the participants had these beliefs and how they were formed were also useful in interpreting the results of the survey as discussed in the following paragraphs.



* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Figure 2. Results of structural model with standardized estimates

Based on the survey data the standardized parameter estimates of the structural model are presented in figure 2. Only four parameter estimates were significant at least at a level of 0.01 while around half of the coefficients were not significant. One statistical explanation is that the significance is weak if the sample size is limited (Hair, 2010; Noar, 2003). In the current study, sample size of 191 was within acceptable range of 30 to 460 for SEM (Wolf et al., 2015). Nevertheless, significance could be improved with a larger sample. A second statistical explanation may be the use of two items for some latent variables as discussed. Despite the possible limitations, the results from the SEM specification

still present important insight and direction (see Table 1). First of all, all dispositional factors, including privacy concern (PC) as well as a grouped variable of faith in humanity and trusting stance (FIH_TS), have no significant path to trust belief. Both very low coefficients show that privacy concern, faith in humanity and trusting stance have negligible influence on the change of trust beliefs. Hence, H1, H2 and H3 are not supported. Second, two situational factors, reputation (Rep) and perceived risks (PR), are significant in effect on trust belief. Reputation has very strong and significant positive effect on trust belief ($b = 0.63$, $p < 0.001$), suggesting that the reputation of online health websites plays an important role in trust for online consumers. Perceived risks are negatively correlated with trust belief at a significant level of 0.05 ($b = -0.29$, $p < 0.05$), while the path between perceived risks and intention to disclose is not significant. Nevertheless, the negative estimate of the path between perceived risk and intention still serves as an insight into the direction of the effect. This implies that trust belief fully mediates the negative effect between perceived risks and intention in disclosure behaviour. Hence, H4 and H5 are validated but H6 is not. Third, among institutional factors, only the path between trust belief and grouped variable regarding perceived effectiveness of privacy statement and third-party certification (PEPS_PETPC) is significant ($b = 0.25$, $p < 0.05$).

The higher the effectiveness perceived by the consumer of the privacy statement and third-party certification such as privacy seals, the higher the perceived consumer trust on online health-related websites. Grouping these variables is supported theoretically as they have common characteristics such as being present on the health-related website and visible to the consumer. Although the effect of perceived effectiveness of the legal framework and regulation is not significant at a level 0.05, the p-value of 0.06 still shows a tendency closer toward an acceptable level of significance compared with that in perceived effectiveness of security infrastructure ($p = 0.10$). Thus, the combination of H7 and H8 is supported, while neither H9 nor H10 is validated significantly. Fourth, the path between trust belief in online health websites and intention to disclose personal information is strongly significant with a high estimated coefficient ($b = 0.77$, $p < 0.001$). This is strong evidence of the TRA and that individual belief shapes intention. Last but not least, the results of square multiple correlation (R^2) show a very good indicator of variance explanation. The trust antecedents, including dispositional, situational and institutional factors explain more than 80% of the variance of trust belief on a transaction-based health website ($R^2 = 0.85$). Trust belief accounts for half of variance in intention of disclosure behaviour ($R^2 = 0.52$). Thus, the results from SEM indicate that the conceptual model still captures important variables and explains much of the variance in the context of consumer trust on online health websites, particularly online pharmacies. Statistically insignificant variables are also very instructive for analysing and gaining insight into consumer belief and behaviour under such circumstances.

Path	Standardized Estimates	Unstandardized Estimates	St. Error	C.R. (t-value)	p-value
FIH_TS → TB	0.04	0.04	0.08	0.25	0.80
PC → TB	0.09	0.09	0.10	0.73	0.45
PELR → TB	0.18	0.17	0.08	1.82	0.06
PEPS_PETPC → TB	0.25	0.22	0.08	2.27	0.03
PESI → TB	0.15	0.12	0.06	1.64	0.10
Rep → TB	0.63	0.55	0.09	5.48	***
PR → TB	-0.29	-0.32	0.11	-2.42	0.02
TB → Int	0.77	0.92	0.15	5.49	***
PR → Int	-0.02	-0.03	0.14	-0.12	0.90

Table 1. Estimates of each path in structural model

5 Discussion

The current study combines the theories in the areas of online trust and personal disclosure to explore consumer trust in the context of transactional health-related websites, particularly online pharmacies. In addition to informative findings on online trust, more general insights into consumer behaviour were made. The primary contribution was to explore consumer trust in the context of health-related websites by further developing McKnight and Chervany's (2000) interdisciplinary model. This model has been applied to many contexts in e-commerce, including technology adoption (McKnight et al., 2011), online transaction (Jarvenpaa et al., 1999) and online banking (Yousafzai et al., 2005). Our research extends the application into the area of transactional health-related websites. We also further develop the model by involving additional factors. First, apart from disposition to trust and institutional trust, situational factors (i.e. reputation and perceived risks) are included. Both situational factors have been validated as strong antecedents of trust. This implies that situational factors have inevitable influence on Internet trust. Second, privacy concern is taken into consideration as part of the dispositional factors. Privacy concern is a construct from research in disclosure behaviour as well as health websites. Our results show that consumers have significant concern about privacy security when faced with a decision to reveal personal data on health websites. The third extension is to include specific institutional factors which are closely connected with disclosure behaviour. In particular, the privacy statement and third-party certification are contextually specific constructs in the scope of the current research. In prior research on institutional trust, regulation and related laws were the most commonly used constructs for general online transactions (McKnight and Chervany, 2002), escrow service for online paying (Pavlou and Gefen, 2004), and privacy statement for online disclosure (Metzger, 2004, 2007). This implies that the influence of the institutional mechanism is a very broad topic, which includes different constructs for different e-commerce contexts. Therefore, the trust model is a combination of prior studies across various fields, with an extension into situational constructs, enrichment by privacy concern and development of institutional factors.

A second theoretical contribution was to apply the interdisciplinary model in the context of disclosing personal information on health websites. There is only limited research on disclosure behaviour that has placed trust as a central factor to explore consumer intention. Therefore, the trust model has been rarely tested for disclosure behaviour. This research is complementary to the studies in the areas of online disclosure as well as health websites. The empirical results indicate that the model evaluated here can explain much of consumer behaviour and explore the role of trust under such circumstances. The implication of our model is that not only research on online transaction but also studies on other online consumer behaviour (e.g. disclosure) can apply McKnight and Chervany's (2000) trust model to explore online trust and related factors. Additionally, this model can describe the process of how online consumers make decisions to trust regarding purchasing medicine online. Due to the fact that there are even fewer studies intensively focused on consumer behaviour on online pharmacies, the current study is trying to discover factors that influence the decision of online health consumers. This model offers insight into a specific research area across e-commerce and healthcare. Thus, the second contribution is indeed to verify the importance of McKnight and Chervany's (2000) trust model, not only for online shopping but also for other e-commerce activities.

Third, it is found that trust belief plays a highly significant role in facilitating online intention, behaviour and decision. The strongly significant correlation between trust belief and intention validates TRA again, suggesting that what an individual thinks and believes significantly impact on what he or she will do. When consumers have strong confidence that a website will protect their personal privacy, they are likely to provide personal information to that websites. When it comes to an unfamiliar situation for which consumers have little experience before, trust belief is far more important to convince someone to take further steps. Furthermore, reputation, an effective privacy statement and privacy seals can facilitate trust building among novice consumers. Low risk perception is also a favourable indicator for consumers to establish trust in a new website. The positive effect of the trust facilitators

mentioned above becomes very strong especially when online consumers make decisions intensively regarding their health and privacy. Hence, trust is a vital factor to support consumer confidence on a newly-emerging health website.

Fourth, the empirical results imply that online consumers have a tendency to rely on more external factors than internal propensity to make decisions in a new e-commerce business model. The strongly significant effect of reputation and perceived risks indicates that one's perception of the external environment provide sufficient information to decide whether a website is trustworthy or not. The relatively significant effect of two institutional factors i.e. privacy statement and third-party certification implies that institutional support perceived by online consumers can enhance trust. On the contrary, dispositional factors show insignificance. It does not necessarily indicate that dispositional factors have no influence at all. It can be argued that the influence is very weak, unclear or mediated by other unidentified factors. Nevertheless, this result provides a distinct insight on how consumers depend on external information sources to establish trust in a very sensitive situation.

Fifth, the current research focuses mainly on the consumers' perspective. In order to study the influence of risks and institutional mechanisms, 'perception' and 'perceived effectiveness' was used to explore the impact on consumers. Most prior studies have discussed only the actual risks, or institutional mechanisms such as the law and privacy seals. However, our findings show that the actual effectiveness of the institutional system might be different from the perception of consumers. Our results show that while the legal framework and regulation in the EU is considered to be well-established and effective, our respondents report an unclear comprehension of these in relation to online pharmacies. Online consumers might not be able to translate regulations, that may actually be effective, into a convincing perception. That is why perceived effectiveness of the legal framework and regulation has a very weak impact on trust belief. This weak impact is despite the elevated role they have in this context due to risks both to health and personal information. They are more important in protecting the consumer from dangers to their health from advice or treatment and loss of their personal health details but due to the lack of awareness and clarity on their role and nature their impact on the consumer is limited. This was also indicated in the focus groups where the discussion on these topics was limited and mostly centred around enquiring and clarifying what the legal framework and oversight are. This is in stark contrast to consumers' understanding on refund and return policies of online vendors of non-health related products and services where there is more experience and a much broader understanding. Therefore, it is an important implication for studies on consumer behaviour, but also other related areas such as e-government, that there can be a significant difference between individual perception and reality on these issues.

Lastly, the contribution of EFA is not only presenting a reflection of several inter-correlated constructs, but also providing another possibility of measurement validation in SEM. First of all, it is found by EFA that faith in humanity and trusting stance are corresponding to the same latent construct. Few scholars in prior studies have distinguished the two constructs or statistically tested them separately (Gefen, 2000), except McKnight and his colleagues in a later research on technology adoption. The results by EFA imply that faith in humanity is inter-correlated with trusting stance, both of which should be regarded as disposition to trust. It is very important for further research which intends to employ McKnight and Chervany's (2000) trust model. The results therefore indicate that EFA can be an option for SEM analysis, especially when CFA is not suitable.

6 Conclusion

This research evaluated how to establish and influence consumer trust in disclosing personal information on transaction-based health websites. The empirical results from our research model based on McKnight and Chervany's (2000, 2002) trust typology indicate several influencing factors. First of all, it is found that external factors regarding situation and institution have more significant effect on consumer trust than internal propensity in this context. Reputation is the most useful indicator for the nov-

ice consumer to establish a trusting belief in a new online pharmacy, while risk perception significantly reduces the trust belief. Second, privacy statements and third-party privacy certification also provide positive signals for consumers to trust a health website. Third, disposition to trust and privacy concern were expected to have influence on trust belief, but empirical results do not support this assumption. One explanation is that the effect might be overwhelmed by other perceived benefits, or be mediated by related factors. Another insight into consumer behaviour on health websites is that online health consumers have very unclear perceptions of purchasing medicine online, because this business model is very new for them. This is reflected on the insignificant results of the related legal framework and regulation, suggesting that online consumers are not fully aware of the details and effectiveness of this oversight. Additionally, the results of consumer intention indicate that people are unwilling to disclose sensitive information such as bank account details and their medical prescription. Trust belief however can strongly support the intention to reveal personal health related data. This study confirms the importance of trust for e-commerce, especially for a new business model regarding health products and service.

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