

Journal of Social Sciences (COES&RJ-JSS)

ISSN (E): 2305-9249 ISSN (P): 2305-9494

Publisher: Centre of Excellence for Scientific & Research Journalism, COES&RJ LLC

Online Publication Date: 1st January 2015

Online Issue: Volume 4, Number 1, January 2015

[http://www.centreofexcellence.net/JJSS/JSS Mainpage.htm](http://www.centreofexcellence.net/JJSS/JSS>Mainpage.htm)

A Moderated Mediation Model of Internet Use for Health Information

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ABSTRACT

Background: Using technology acceptance model (TAM), prior studies revealed that attitude towards Internet use for health information differently affected behavioral intention to use the Internet for health information. In other words, some results showed a smaller influence of attitude on Internet use for health information as compared to results of other researches. The level of health consciousness could explain the differences in the existing literature on magnitude of the influence of attitude towards Internet use for health information on the Internet use.

Objectives: The main objective of the study is to examine the moderating effect of health consciousness on the influence of attitude towards using the Internet for health-related information on Internet use for health information seeking in TAM framework. Furthermore, the study aims to test the mediating role of attitude towards Internet for health information in the effect of cognitive beliefs (i.e. perceived usefulness and perceived ease of Internet use) on Internet use for health information seeking.

Method: Data for the present study were collected using convenience sampling. The sample consisted of female Internet users living in the state of Selangor, Malaysia. Partial Least Squares-Structural Equation Modeling method was used to test the research hypotheses based on the response from a total of 303 participants.

Results: The results of this study showed that when there is a high level of health consciousness (i) attitude partially mediates the influence of perceived usefulness on Internet use for health information and (ii) perceived ease of Internet use has an indirect effect on Internet use for health information through attitude towards using the Internet for health-related information.

Keywords: Technology acceptance model, health consciousness, moderation mediated effect, PLS

JEL Classification Codes Guide: L86

Citation:

Sharif, Saeed Pahlevan; Ahadzadeh, Ashraf Sadat; Wei, Khong Kok, (2015); A Moderated Mediation Model of Internet Use for Health Information; Journal of Social Sciences (COES&RJ-JSS), Vol.4, No.1, pp: 611-625.

<http://dx.doi.org/10.17632/rdy5t6zgf.w.1>

Introduction

People are increasingly using the Internet to obtain the variety types of information to make decisions for and get involved with different aspects of their daily life including health (Fox & Fallows, 2003; Fox, Rainie, & Horrigan, *et al.*, 2000). A fair amount of evidence suggests that women have more online health information seeking behavior as compared to men (Fox, 2006; Fox & Duggan, 2013; Ybarra & Suman, 2006). In Malaysia, using the Internet to manage health and to learn more about diseases has become increasingly important due to the increase in the prevalence of chronic diseases (Hashim, 2003), in particular among women (Ministry of Health, 2011). Although the number of male Internet users is higher than female users, women are and this is also true for Malaysian women (Komathi & Maimunah, 2009).

Using technology acceptance model (TAM), several studies found that attitude towards Internet usage for health information is the key factor influencing Internet usage for health-related information (Lim, *et al.*, 2011; Wong, Yeung, Ho, Tse, & Lam, 2012; Yun & Park, 2010).

However, the magnitude of this influence is varied in different studies. Wong *et al.*'s (2012) study, for instance, showed that attitude towards Internet for health information has a smaller influence on intention to use the Internet ($\beta = 0.36$) as compared to Yun and Park's study (2010) ($\beta = 0.74$) and Kim and Park's study (2012) ($\beta = 0.92$).

It is strongly argued that attitude can have a strong impact on the behavior, but this influence could occur only under certain conditions or for certain type of individual. In other words, the degree to which attitude influences behavior could be assumed to depend on factors closely related to the person and characteristics of the person performing the behavior (Ajzen & Fishbein, 1977).

Keeping this in mind, it could be assumed that individuals' health consciousness (HCO) could come into play as moderator for the influence of attitude towards Internet use for health purposes on the Internet usage for health information. Therefore, individuals high in HCO are thought to be highly concerned about their health and motivated to do anything to stay healthy whereas individuals low in HCO are assumed not to have concern about their health and pay less attention to their health. Further study is, therefore, required to test whether attitude towards Internet usage for health information more positively influences Internet usage for health information for those high in HCO as opposed to those low in HCO.

The main objective of the current study is to test the moderating effect of (HCO) on the influence of attitude towards using the Internet for information regarding health on Internet use for health information seeking within TAM framework. Furthermore, the study aims to test the mediating role of attitude towards Internet for health information in the effect of cognitive beliefs (i.e. perceived usefulness and perceived ease of Internet use) on Internet use for health information seeking.

Background of Research and Hypotheses Development

Theoretical Framework: Technology Acceptance Model

Technology Acceptance Model (TAM) has been frequently studied by scholars in different contexts. The major objective of proposing TAM by Davis (1989) was to predict the whether the perceived usefulness (PU) of technology, perceived ease of technology usage (PEOU) and attitude (ATT) towards technology predict behavior toward technology acceptance. PU is defined as the "degree to which a person believes that using a particular technology would enhance his/her performance on a task" while PEOU is defined as the, "degree to which a person believes that using a particular system would be free from effort". (Davis, 1989, p. 320). Davis (1989) argued that PU is more important determinant

than PEOU. Another component of TAM is attitude which refers to an individual's positive or negative evaluation of performing the behavior. It involves an individual's judgment that performing a behavior is good or bad and also a general evaluation that an individual is inclined or disinclined to perform the behavior (Ajzen & Fishbein, 1980).

TAM framework posits that PU and PEOU as initial drivers for technology acceptance behavior influence on ATT towards using the technology which in turn influences behavioral intention to use which in turn influences actual use, as shown in Figure 1. PU also influences behavioral intention to use technology as well as actual technology use (Davis, 1989). However, studies showed that PEOU also directly plays an essential role in recognizing to actual use of technology (Turner, Kitchenham, Brereton, Charters, & Budgen, 2010; Yusoff, Muhammad, Zahari, Pasah, & Robert, 2009).

Compared to PEOU, PU has explained a greater variance of technology usage. Several research studies have indicated that PU is more influential factor predicting technology usage than PEOU (Igbaria, Zinatelli, Cragg, & Cavaye, 1997; Jeong & Yoon, 2013; Park, Kim, & Kim, 2013). Examining the most significant and powerful variables of the TAM affecting microcomputer usage, Igbaria *et al.* (1997) found that PU and PEOU significantly and positively contribute to technology usage. However, PU had a larger influence than PEOU.

Adding or removing some constructs, researchers have modified the original TAM. However, three most important constructs of TAM (i.e. PU, PEOU and attitude) have mostly remained. The construct "intention to use technology" has been focused for revising the original TAM framework. A construct that is often been eliminated from the original TAM is behavioral intention (BI) which plays the role of mediating variable between PU, PEOU, and attitude towards technology usage (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989; Horton, Buck, Waterson, & Clegg, 2001). Horton *et al.* (2001) stressed that BI should be removed from the TAM framework in order to realize the direct effects of other constructs such as attitude, PU, PEOU on technology usage. Additionally, studies revealed that BI has not mediated the influence of PU, PEOU, and attitude on technology use (Horton, *et al.*, 2001; Mohanty & Turner, 2006). Therefore, the current study excludes BI and examines the direct influence of PU, PEOU, and attitude on technology usage.

Internet Use for Health Information from TAM Perspective

A Great number of empirical studies revealed the ability of TAM to explain technology use in different contexts including Internet use for health information (Kim & Park, 2012; Lemire, Pare, Sicotte, & Harvey, 2008; Lim, *et al.*, 2011; Wong, *et al.*, 2012; Yun & Park, 2010).

Research studies provided evidence in support of the PU effect on the usage of information technologies for health-related issues. For instance, Lemire *et al.* (2008) found the positive and significant influence of PU of a health website on the usage of the site as a preferred source of health information as well as the frequency of health site use. Using TAM framework, Lim *et al.* (2011) also carried out a research to investigate behavioral intention to use mobile phone for health-related information among Singaporean women. The authors found that PU as a core TAM variable was found to be significantly and positively contributed to behavioral intention to use mobile phone for health information. Similarly, Wong *et al.* (2012) used TAM constructs to examine the determinants of intention to use Internet to look for health-related information among Chinese older adults. Findings showed that PU of Internet has a significant positive effect on intention to use Internet for health information seeking, indicating that individuals with

higher PU presented higher behavioral intention to use Internet for health information. Based on the TAM and the literature, the following hypothesis is proposed:

H1: Perceived usefulness of Internet for health management has a significant positive effect on Internet use for health formation.

Regarding the influence of PEOU of health information technology on technology use, Lim *et al.* (2011) found that PEOU of mobile has a significant impact on intention to use mobile phone for health information seeking. Wong *et al.* (2012) also discovered that PEOU has a significant effect on behavioral intention to use Internet for health related Information, indicating that Internet users with higher PEOU have a higher intention to use the Internet for health information. The following hypothesis is, therefore, proposed:

H2: Perceived ease of Internet use has a significant positive effect on the Internet use for health information.

In addition to technology usage, attitude is also influenced by PU and PEOU based on the TAM framework. Regarding the influence of PU of Internet for health information and PEOU on attitude towards Internet usage for health issues, Yun and Park (2010) found that PU of Internet for disease information seeking and PEOU for seeking disease information positively influenced attitude towards Internet use for disease information. In consistent with Yun and Park (2010), Kim and Park (2012) also identified that attitude towards health information technology usage is significantly affected by PU of health information technology and PEOU. Thus, the following hypotheses are proposed:

H3: Perceived usefulness of Internet for health management has a significant positive effect on attitude towards Internet use for health information.

H4: Perceived ease of Internet use has a significant positive effect on attitude towards Internet for health management.

Regarding the relationship between attitude toward health information technology usage and technology usage for health-related issues, Yun and Park (2010) found that attitude to using the Internet for seeking disease information had a significant impact on the intention to use this technology for seeking disease information. Similarly, the positive influence of attitude towards health information technology usage on health information technology usage was found in Kim and Park (2012)'s study. Additionally, based on the TAM framework (Davis, 1989) and prior study (Kim & Park, 2012) attitude mediates the effects of PU and PEOU on Internet use for health information. Based on this literature, the following hypothesis is, therefore, proposed:

H5: Attitude towards Internet use for health management has a significant positive effect on Internet use for health information.

Moderating Impact of Health Consciousness

Health consciousness is "the degree to which health concerns are integrated into a person's daily activities" (Jayanti & Burns, 1998, p. 10). Health conscious people are aware of and concerned about their wellness and are motivated to improve and/ or maintain their health (Chen, 2011, p. 255)(Chen, 2011, p. 255). HCO is a predictor of the use of communication channels for health information seeking (Dutta-Bergman, 2006),

especially Internet (Dutta-Bergman, 2004a, 2004b). HCO increases the amount of health-related information obtained from media sources such as TV, radio programs, books, newspaper, magazines, advertising and pamphlets about health (Moorman & Matulich, 1993). If a person has a higher degree of HCO then he or she has more positive attitude towards Internet usage for health information (Yun & Park, 2010), consequently more willing to engage in online health information seeking behaviour (Dutta-Bergman, 2004a, 2004b) to find helpful information to maintain good health and prevent disease. On the contrary, it is difficult to expect those people who have a low degree of HCO use Internet for health information. In other words, for those female Internet users who are concerned about their health at low level they show little interest in health-related activities, in particular health information seeking on the Internet. Consequently, they rarely use the Internet for health information to maintain, promote, and manage their health. HCO can be also assumed to moderate the effect of attitude towards Internet use for health on Internet adoption for health information. Depending on HCO level, the influence of attitude on Internet use would be, therefore, varied. In other words, attitude more positively affects Internet usage under high level of HCO as compared to the condition where HCO level is low. To date, no study has examined the moderating effect of HCO on the influence of attitude towards Internet use for health purposes on the Internet usage for health information. Thus, the following hypothesis is proposed:

H6: Health consciousness moderates the influence of attitude towards Internet use for health management on Internet use for health information.

Based on the TAM framework, the influence of PU of Internet for health information and PEOU on technology use is mediated by attitude. It indicates that favorable affective feeling towards Internet use for health become central for those who perceive Internet useful for health management and easy to search for health information. Meanwhile, as it was discussed, this research proposes that HCO positively moderates the effect of attitude towards Internet use for health management on Internet use for health information. Thus, all together the following hypotheses are proposed:

H7: Health consciousness positively moderates the mediation effect of perceived usefulness of Internet for health management on Internet use for health information through attitude towards Internet use for health management.

H8: Health consciousness positively moderates the mediation effect of perceived ease of Internet use on Internet use for health information through attitude towards Internet use for health management.

Methodology

Participants and Data Collection

For this study, a questionnaire was used to collect data. It contained 34 items measuring PU of Internet for health information and management, perceived ease of Internet use, attitude towards Internet use for health issues, Internet use for health information and HCO.

The research participants were recruited among Malaysian females residing in the state of Selangor, an urban area in Malaysia. Questionnaires were distributed among women who

were Internet users and had willingness to attend the study. The convenience samples were sourced from women working in governmental institutions located in Selangor state through friends' contacts.

From 330 questionnaires returned back to the researchers, three hundred three responses were identified as usable after excluding cases that have not used the Internet for health information, cases that had more than 10 percent missing values and cases that were identified as outliers.

Measurement of Variables

PU of Internet for health information and health management and PEOU of Internet were assessed by the eight items developed by Davis (1989). All items of these constructs were rated on a 5-point Likert-type scale (1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree and 5= Strongly agree). Higher score indicated the more PU of Internet for health information and health management and more PEOU. Four items on attitudes toward Internet use for health information were adopted from Wong *et al.*'s study (2012). All items of these constructs were rated on a 5-point Likert-type scale (1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree and 5= Strongly agree). Higher score indicated the more favorable attitude towards Internet use for health information. Internet usage for seeking health information was measured by eleven items which they were adopted from past studies (Hale, Cotten, Drentea, & Goldner, 2010; Yoo & Robbins, 2008). Respondents were asked to determine how frequently they use the Internet for health and medical information. All items were rated on a 5-point Likert-type scale (5= Always, 4= Often, 3= Sometimes, 2= Rarely, and 1= Never). Higher score indicated higher frequency of Internet usage for health information seeking. Participants' HCO measured by eleven items covering most facets of HCO was adopted from Chen (2011). All items of these constructs were rated on a 5-point Likert-type scale (1= Strongly disagree, 2= Disagree, 3=Neutral, 4= Agree and 5= Strongly agree) (see Appendix 1).

General Characteristics of the Participants

As indicated in Table 1, a majority of participants (42%) were made up of the 30 to 39 age group (with mean age= 34), married (67%), had a secondary school (50%), and had income in the range of RM3000-5999 (47%).

Table1. Demographic Characteristics (N=303)

	Frequency	Percentage	Mean	SD
Age (Years)			34	8
20-29	116	38		
30-39	128	42		
40-49	46	15.5		
≥50	13	4.5		
Marital Status				
Single	95	31		
Married	202	67		
Others	6	2		
Education Level				
Primary school	21	7		
Secondary school	151	50		

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College/university	131	43		
Household Income (RM)			3428	1824
1000-2999	118	39		
3000-5999	144	47		
6000-8999	39	13		
≥ 9000	2	1		

Data Analysis

1.1. Measurement Models Assessment

First of all, we evaluate validity of all reflective and formative measurement models. The results of the assessment of reflective measurement models are shown in Table 1. As it is shown, construct reliability of HCO (0.928), PEOU (0.882), PU (0.916), and ATT (0.938) are greater than 0.7 which indicates high internal consistency and reliability (Hair, Black, Babin, & Anderson, 2010). The average variance extracted (AVE) of HCO (0.619), PEOU (0.653), PU (0.785), and ATT (0.790) are greater than 0.5 and they are less than their respective construct reliability. This demonstrates that convergent validity of all reflective constructs is established (Hair et al., 2010). Besides, Maximum Shared Squared Variance (MSV) and Average Shared Square Variance (ASV) of HCO (0.171 & 0.102), PEOU (0.288 & 0.122), PU (0.270 & 0.159), and ATT (0.288 & 0.196) are less than their respective AVE. Thus, all reflective constructs in the model have discriminant validity (Hair et al., 2010) as well.

TABLE 1
Reflective Measurement Model Assessment

Construct / Measure (Construct Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Squared Variance (MSV), Average Shared Square Variance (ASV))	Factor Loading
Health consciousness (CR = 0.928, AVE = 0.619, MSV = 0.171, ASV = 0.102)	
HCO 1 I have the impression that I sacrifice a lot for my health.	0.785
HCO 2 I consider myself very health conscious.	0.719
HCO 3 I actively try to prevent disease and illnesses.	0.827
HCO 4 I think that I take health into account a lot in my life.	0.850
HCO 5 I think it is important to know well how to eat healthy.	0.871
HCO 6 My health is so valuable to me, that I am prepared to sacrifice many things for it.	0.687
HCO 7 I do not continually ask myself whether something is good for me.	0.793
HCO 8 I often dwell on my health.	0.742
Perceived ease of Internet use (CR = 0.882, AVE = 0.653, MSV = 0.288, ASV = 0.122)	
PEOU 1 Learning to use the Internet for searching health information was easy for me.	0.728
PEOU 2 My interaction with the Internet for health information is clear and understandable.	0.837
PEOU 3 I find the Internet for health information to be flexible to interact with.	0.818
PEOU It is easy for me to become skillful at using the Internet for health information.	0.843

Perceived usefulness of Internet (CR = 0.916, AVE = 0.785, MSV = 0.270, ASV = 0.159)		
PU 1	Using the Internet is useful in managing my daily health.	0.867
PU 2	Using the Internet for health information is advantageous in better managing my health.	0.917
PU 3	Using the Internet for health information is beneficial to me.	0.873
Attitude towards health related Internet use (CR = 0.938, AVE = 0.790, MSV = 0.288, ASV = 0.196)		
ATT 1	Using Internet for health information and health management would be a good idea.	0.905
ATT 2	Using Internet for health information and health management would be a wise idea.	0.891
ATT 3	I like the idea of using Internet for health information and health management.	0.880
ATT 4	Using Internet for health information and health management would be a pleasant experience.	0.879

In order to assess IS as a formative construct, we evaluate (i) collinearity among its formative indicators as well as (ii) relative and absolute contribution of formative indicators to forming IS. The results of the assessment of IS measurement model are shown in Table 2. As it is shown, maximum VIF of indicators of IS (3.420) is less than five and IS inter-item correlation ranges between 0.311 and 0.751 which is less than 0.9. Thus, there is no collinearity issue among formative indicators of IS (Field, 2013). Besides, although some of IS indicators do not have significant outer weight and relative contribution to forming IS, outer factor loadings of all indicators are significant at 95% confidence level which indicates that they have significant absolute contribution to forming the construct.

TABLE 2
Formative Measurement Model Assessment

Construct / Measure	Indicator Outer Weights (<i>t</i> -value)	Indicator Outer Loadings (<i>t</i> -value)
Internet usage for medical and health information seeking (IS) (Range of inter-item correlations= 0.311-0.751; Average inter-item correlation: 0.528; Max. VIF= 3.420)		
IS1	I use the Internet to get general health information 0.012* (0.079)	0.429** (3.022)
IS2	I use the Internet to get information on medicine/drug 0.474** (2.742)	0.843*** (6.216)
IS3	I use the Internet to be equipped with information before/after doctoral appointment -0.094 ^{ns} (0.304)	0.618** (3.130)
IS4	I use the Internet to get description of various diseases 0.142 ^{ns} (0.781)	0.740*** (5.508)
IS5	I use the Internet to get information on treatments/therapy/ -0.064 ^{ns}	0.525***

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	diagnosis	(0.299)	(3.568)
IS6	I use the Internet to get information on how to care for oneself	-0.180 ^{ns} (0.935)	0.595 ^{***} (3.891)
IS7	I use the Internet to decide about how to treat an illness	0.463 [*] (2.122)	0.857 ^{***} (6.328)
IS8	I use the Internet to decide about whether or not visit a doctor	0.066 ^{ns} (0.305)	0.630 ^{***} (4.008)
IS9	I use the Internet to understand how to deal with an illness	0.108 ^{ns} (0.372)	0.728 ^{***} (4.966)
IS10	I use the Internet to get information on hospitals/clinics/other healthcare facilities	0.061 ^{ns} (0.368)	0.476 ^{***} (3.443)
IS11	I use the Internet to get information for health management (exercise, abstinence from drinking, smoking, diet, nutrition, stress, mental health, etc.)	0.219 ^{ns} (0.799)	0.656 ^{**} (2.961)

*, **, and *** indicate statistical significance at the 0.05, 0.01, and 0.001 levels respectively. *ns* indicates not significant at 95% confidence level based on $t(1999)$, one-tailed test). $t(0.05, 1999) = 1.646$, $t(0.01, 1999) = 2.328$, $t(0.001, 1999) = 3.094$.

1.2. Structural Model Assessment and Hypothesis Testing

This research uses Partial Least Squares Structural Equation Modeling (PLS-SEM) method and smartPLS software to analyse the structural model (Ringle, Wende, & Will, 2005). This is because PLS-SEM can cope with both reflective and formative constructs (Ragavan, Subramonian, & Pahlevan Sharif, 2014). The results of analyzing the model by PLS algorithm and bootstrapping technique with 2000 samples are reported in Table 3. The results of total effect model show that PU has a significant positive effect on IS ($\beta = 0.453$, t -value = 6.135) and the first hypothesis is supported at 95% confidence level. However, the effect of PEOU on IS is not significant at 95% confidence level ($\beta = -0.122$, t -value = 0.833) and the second hypothesis is not supported. Thus, we can test mediation effect of PU on IS and indirect effect of PEOU on IS through ATT while their path from ATT to IS is positively moderated by the effect of HCO.

Figure 1.a: Total Effect Model

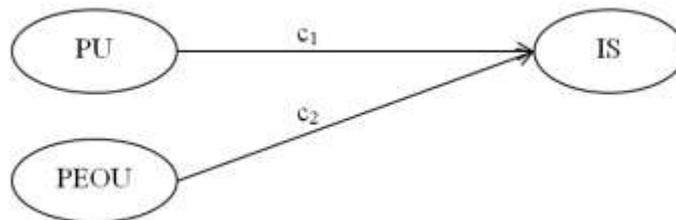


Figure 1.b: Moderated Mediation Effect Model

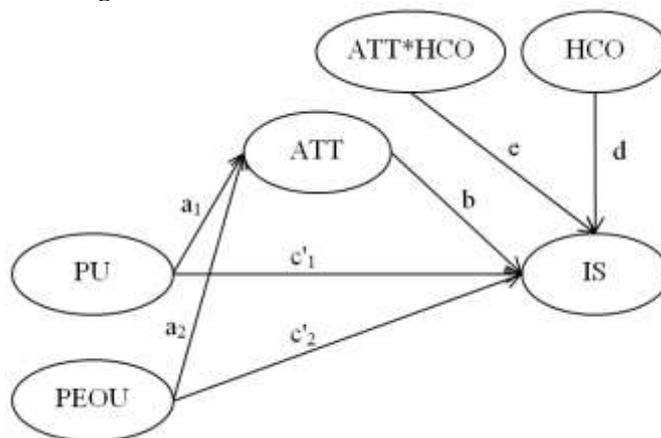


TABLE 3
Structural Model Assessment

	Hypothesis	Standardized Path Coefficient (t-value)	Percentile 95% confidence intervals
Total Effect			
IS			
(R ² = 17.29%; Q ² = 6.77%)			
← PU (c ₁)	H1	0.453 ^{***} (6.135)	[0.332; 0.575]
← PEOU (c ₂)	H2	-0.122 ^{ns} (0.833)	[-0.362; 0.119]
Direct Effect			
ATT			
(R ² = 40.72%; Q ² = 39.45%)			
← PU (a ₁)	H3	0.372 ^{***} (6.255)	[0.274; 0.470]
← PEOU (a ₂)	H4	0.399 ^{***} (7.533)	[0.312; 0.486]
IS			
(R ² = 20.84%; Q ² = 20.83%)			
← ATT (b)	H5	0.026 ^{ns} (0.415)	[-0.078; 0.131]
← PU (c' ₁)		0.337 ^{***} (6.130)	[0.246; 0.427]
← PEOU (c' ₂)		-0.088 ^{ns} (1.215)	[-0.207; 0.031]
← HCO (d)		0.213 ^{***} (3.831)	[0.122; 0.305]
← ATT*HCO (e)	H6	0.137 ^{**} (2.697)	[0.053; 0.220]
Moderated Indirect Effect			
IS			
(R ² = 20.84%; Q ² = 20.83%)			
← ATT ← PU HCO (a ₁ *b + a ₁ *e*HCO)	H7		
← ATT ← PU HCO = -1 SD (a ₁ *b - a ₁ *e)		-0.041 ^{ns} (-1.300)	[-0.093; 0.011]
← ATT ← PU HCO = 0 SD (a ₁ *b)		0.010 ^{ns} (0.417)	[-0.029; 0.049]
← ATT ← PU HCO = +1 SD (a ₁ *b + a ₁ *e)		0.061 [*] (1.879)	[0.008; 0.114]
← ATT ← PEOU HCO (a ₂ *b +	H8		

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$a_2 * e * HCO$	$\leftarrow ATT \leftarrow PEOU \mid HCO = -1 \text{ SD}$	-0.044 ^{ns} (-1.424)	[-0.095; 0.007]
$(a_2 * b - a_2 * e)$	$\leftarrow ATT \leftarrow PEOU \mid HCO = 0 \text{ SD}$	0.011 ^{ns} (0.404)	[-0.032; 0.053]
$(a_2 * b)$	$\leftarrow ATT \leftarrow PEOU \mid HCO = +1$	0.065 [*] (1.829)	[0.007; 0.123]
SD ($a_2 * b + a_2 * e$)			

*, **, and *** indicate statistical significance at the 0.05, 0.01, and 0.001 levels respectively. *ns* indicates not significant at 95% confidence level based on $t(1999)$, one-tailed test). $t(0.05, 1999) = 1.646$, $t(0.01, 1999) = 2.328$, $t(0.001, 1999) = 3.094$.

The moderated mediation model is developed by adding ATT as the mediator and HCO as the moderator on the effect of ATT on IS (Fig. 1.b). The results show that both PU ($\beta = 0.372$, t -value = 6.255) and PEOU ($\beta = 0.399$, t -value = 7.533) have positive significant effect on ATT. Thus, the third and fourth hypotheses are supported at 95% confidence level. However, this research could not support the fifth hypothesis which proposes the positive direct effect of ATT on IS ($\beta = 0.026$, t -value = 0.415). This is due to the moderating role of HCO on the effect of ATT on IS ($\beta = 0.137$, t -value = 2.697) which is significant at 95% confidence level and indicates the effect of ATT on IS depends on the HCO level and supports this research sixth hypothesis.

The moderated mediation effect of PU on IS through ATT when the effect of ATT on IS depends on HCO is $(a_1 * b + a_1 * e * HCO)$. The results show that the indirect effect of PU on IS through ATT for the medium level of HCO which is called the reference point ($\beta = 0.010$, t -value = 0.417) and for lower HCO (i.e. HCO decreases by one standard deviation point) ($\beta = -0.041$, t -value = -1.300) is not significant at 95% confidence level. However, by increasing HCO (i.e. HCO increases by one standard deviation point), this moderated mediation effect will be stronger and becomes significant ($\beta = 0.061$, t -value = 1.879). It means with high level of HCO, PU has a significant positive indirect effect on IS through ATT. Indeed, the non-significant indirect effect of PU on IS in low and medium level of HCO is due to the weak and non-significant effect of ATT on IS in this condition. As the direct effect of PU on IS still is significant ($\beta = 0.337$, t -value = 6.130), the effect of PU on IS is partially mediated through ATT while HCO positively moderates the positive effect of ATT on IS and the seventh hypothesis is supported. Similarly, moderated indirect effect of PEOU on IS through ATT ($a_2 * b + a_2 * e * HCO$) while is not significant for low ($\beta = -0.044$, t -value = -1.424) and medium ($\beta = 0.011$, t -value = 0.404) level of HCO, becomes significant when HCO gets higher ($\beta = 0.065$, t -value = 1.829). It indicates that the indirect effect of PEOU on IS through ATT will be stronger and significant in higher level of HCO and the eighth hypothesis is partially supported as well.

This model explains 20.84% of IS. In addition, Stone-Geisser's Q^2 value for IS ($Q^2 = 20.83\%$) indicates that the model has predictive relevance (Geisser, 1974; Stone, 1974; Henseler, Ringle, and Sinkovics, 2009; Tenenhaus, Vinzi, Chatelin, and Lauro, 2005).

Discussion and Conclusion

The results of this study showed that there is a positive influence of PU of Internet on Internet use for health information (H1). This finding lends support to Wong *et al.* (2012) study which found that PU of Internet is significant in influencing women' intention to use the Internet for health information. Furthermore, the findings of the current study are in

line with Lim *et al.* (2012) study which revealed that PU significantly and positively contribute to the behavioral intention to use mobile phone for health information.

The present study also revealed that PEOU has no positive influence on Internet use for health information (H2). This result does not provide support for prior studies which revealed that perceived ease of Internet use is an antecedent of behavioral intention to use health information technology (Kim & Park, 2012; Yun & Park, 2010).

In agreement with past studies (Kim & Park, 2012; Yun & Park, 2010), this research also found that PU of Internet for health management and PEOU of Internet both have a positive effect on attitude towards Internet use for health information (H3 & H4), supporting that cognitive beliefs with regards to health information technology lead to affective feelings about Internet use for health management.

The effect of attitude on Internet use was not found in this study (H5). This result is not consistent with Kim and Park's (2012) study which found that favorable attitude towards the use of health information technology positively does contribute to adoption of health information technology. The positive influence of attitude on the Internet use is positively moderated by the effect of health consciousness (H6). It indicates that affective feeling about Internet use has no ability to solely contribute to Internet use for health information. Thus, it needs to be juxtaposed by individuals' concern about their health.

It was also found that attitude partially mediates the influence of PU on Internet use for health information, when the influence of attitude on Internet use is moderated by health consciousness (H7). Besides, PEOU has an indirect effect on the Internet use when there is a high level of health consciousness (H8).

To the best of the researchers' knowledge, this study was the first attempt to investigate the moderating effect of health consciousness on the influence of attitude towards Internet use for health management on Internet use for health information. The study found that high level of health consciousness indeed exerts a positive influence on the relationship between attitude towards Internet use for health and Internet use for health information. Women with low and medium level of health consciousness do not use the Internet for health information even if they have a positive affective feeling towards Internet use for health management. On the other hand, those who possess high level of health consciousness tend to use the Internet whether when they have favorable attitude towards Internet use for health information.

Limitations and Directions for Future Works

The present study was limited in several ways. First, the sample population was relatively homogenous in that they were women working for governmental organizations located in Selangor state of Malaysia. Therefore, a more comprehensive future study is suggested to include other population of women to provide more accurate and precise information and enhance the generalizability of the findings.

Secondly, apart from health consciousness examined in the current study there are other health-related factors such as perceived health risk which could be examined as a

moderator influencing the relationship between attitude towards Internet use for health information and Internet usage. Additionally, the examination of the joint moderating influence of health consciousness and other health-related factors is also suggested for the future study.

Lastly, the present study only focused on Internet use for searching health information. However, Internet also might be used to communicate for health-related purposes such as emailing with doctor or health providers, chatting with people experiencing a specific illness, sharing and exchanging experiences on health-related issues. Thus, further study is suggested to examine the communication function of Internet for health-related purposes.

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Appendix A

Constructs	Items	Source (s)
Health consciousness	1-I have the impression that I sacrifice a lot for my health.	Chen (2011)
	2-I consider myself very health conscious.	
	3-I think that I take health into account a lot in my life.	
	4-I think it is important to know well how to stay healthy.	
	5-My health is so valuable to me, that I am prepared to sacrifice many things for it.	
	6-I have the impression that other people pay more attention to their health than I do. (R)	
	7-I do not continually ask myself whether something is good for me. (R)	
	8-I really don't think often about whether everything I do is healthy. (R)	
	9-I don't want to ask myself all the time, whether the things I eat are good for me. (R)	
	10-I often dwell on my health.	
	11-I am prepared to do many things to have good health.	
Perceived usefulness of Internet	1-Using the Internet for health information is useful in managing my daily health.	Davis (1989)
	2-Using the Internet for health information is advantageous in better managing my health.	
	3-Using the Internet for health information is beneficial to me.	

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	4-Using the Internet for health information is valuable to my healthcare.	
Perceived ease of Internet use	1-Learning to use the Internet for searching health information was easy for me.	Davis (1989)
	2-My interaction with the Internet for health information is clear and understandable.	
	3-I find the Internet for health information to be flexible to interact with.	
	4-It is easy for me to become skillful at using the Internet for health information.	
Attitude	1-Using Internet for seeking health information and health management would be a good idea.	Wong et al. (2012)
	2-Using Internet for seeking health information would be a wise idea.	
	3-I like the idea of using Internet for seeking health information and health management.	
	4-Using Internet for seeking health information and health management would be a pleasant experience.	
Internet use for health information seeking	1-I use Internet to get general health information.	Items 1-7 from Yoo and Robinson (2008)
	2-I use Internet to get description of various diseases.	
	3-I use Internet to get information on medicine/drug.	
	4-I use Internet to be equipped with information before/after doctor appointment.	
	5-I use Internet to decide about whether or not visit a doctor.	
	6-I use Internet to decide about how to treat an illness.	
	7-I use Internet to understand how to deal with an illness.	
	8-I use Internet to get information on treatments/therapy/ diagnosis.	Items 8 & 9 from Kim and Park (2012)
	9-I use Internet to get information on hospitals/clinics/other healthcare facilities.	
	10-I use Internet to get information for health management (exercise, abstinence from drinking, smoking, diet, nutrition, stress, mental health, etc.).	
	11-I use Internet to get information on how to care for oneself.	

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