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遠距居家照護科技接受行為之預測：整合 TAM、HBM 及創新接受程度
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遠距居家照護科技接受行為之預測：整合 TAM、HBM 及創新接受程度

摘要

遠距居家照護是台灣目前新興發展之服務產業中的重點發展計畫之一。 因此，本計畫的主要目的是整合健康信念模式、科技接受模式及創新接受程度於建構遠距居家照護科技接受行為之預測模式，並透過民眾之性別與年齡的干擾效果的探索以提升此預測模式之預測能力。計畫中共蒐集 369 個有效樣本，且利用結構方程模式（SEM）來驗證此因果模式以及採用多群體之 SEM 來探索民眾性別與年齡之干擾效果。研究結果顯示此整合模式具有好的適配度及預測能力，而且加入性別與年齡之干擾效果的考量將更能提升此預測模式之預測能力。計畫報告中亦依此研究結果提供台灣政府及醫療照護科技發展者相對應之管理意涵與建議。

關鍵字：遠距居家照護，健康信念模式，科技接受模式，創新接受程度，干擾效果

Predicting home telehealth adoption: Application of the technology acceptance model, health belief model and innovativeness

ABSTRACT

Home Telehealth has been one of the important projects in the newly developing service industry in Taiwan. The purpose of this study, therefore, is to develop a predicating model, which can be used to reveal the intention to accept and adopt Home Telehealth. The health belief model (HBM), the technology acceptance model (TAM), and innovativeness theory were first combined into an unified model. And the moderating effects of gender and age were then considered to enhance the predicting capability of this model. The structural equation modeling (SEM) technique was used to interpret the causal model, and the multiple-group SEM was used to examine the moderating effects by 369 samples. The research results indicate that the unified model is considered to be of good fit and confirm the moderating effects of a user's gender and age. The suggestions and implications for the Taiwanese government and hospital managers were also presented.

Keywords: Home Telehealth, health belief model, technology acceptance model, innovativeness, moderating effect

1. INTRODUCTION

An aging population and increasing number of chronic diseases have led to a considerable demand for healthcare (Koch, 2006; Li & Perkins, 2007; OECD, 2007). To improve healthcare for the general public, most countries have escalated their efforts to research and develop a relevant healthcare information technology (IT) that would allow a healthcare service system to provide the needed healthcare services to the people. According to the annual report of the Department of Social Affairs of the Ministry of the Interior in Taiwan, in 2008, the current aging population has exceeded 10% of the entire population. The Council for Economic Planning and Development has likewise indicated that the aging population in Taiwan will increase from 10％ to 20％ in 25 years.Therefore, developing applicable healthcare service proactively has become an important issue for the Taiwanese government.

Given the advantages of integrated telecommunication technology and IT to support medical care, the Taiwanese government has invested a great deal of efforts to facilitate long-term care, and has listed "Home Telehealth" as one of the necessary projects of the newly developing service industry of Taiwan in 2008. It is expected that the Home Telehealth care market will be worth NT$7 billion by the year 2010 for Taiwan, presenting that Home Telehealth will become the main trend in healthcare service in the 21st century. However, the development of Home Telehealth is still in the initial stage in Taiwan. Thus, understanding and evaluating users' intention to adopt this new healthcare technology is of greater importance for the government to improve the service quality of Home Telehealth. The purpose of this study, therefore, is to develop a predicting model, which can be used to reveal the intention to accept and adopt Home Telehealth.

According to relevant researches, the Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989;) and the Innovation Acceptance Model (IAM) have been widely used in predicting users' acceptance of new information technologies (ITs)/information systems (ISs); thus this study believes that the combination of these two models is feasible for exploring the users' intention of using a newly developing healthcare IT. However, since these two models do not include the elements of patients' health behaviors, the Health Belief Model (HBM), which has been commonly used in explaining and predicting health-related behaviors, was also considered to enhance the predicting model for Home Telehealth.

Moreover, most related researches indicate that the moderated effects of several demographic variables have to be examined in the structure model. For example, Morris & Venkatesh (2000) suggested that user's age has significant moderate effect on obtaining customer service over a technology-based medium. Im, Kimb, and Han (2007) indicated that the gender of college students was a moderator of the message platform usage. And Ha, Yoon, and Choi (2007) confirmed that both of the user's age and gender have significant moderating effects on the mobile game usage. Hence, to enhance the predicting capability of this new proposed unified model, two moderators, namely, gender and age variables, which were used as the most critical classified variables in the information technology market, were also included. It is expected that this unified model, as well as the moderating effects, will be useful for both system developers and hospital managers in improving the efficiency of the Home Telehealth system and thus attract more people to use it.

2. LITERATURE REVIEW

2.1 Technology Acceptance Model

The TAM was developed from the Theory of Reasoned Action. The TAM includes five constructs related to the use of technology, namely, perceived ease of use (PEOU), perceived usefulness (PU), attitude toward use (ATT), behavioral intention to use (BI), and actual behavior on use (AU). Among these constructs, PU and PEOU have been regarded as the most important factors in the processes of accepting new ITs because PEOU not only has direct impact on PU, but also has indirect impact on BI through ATT. Related researches define PU as "the degree to which a person believes that using a particular system would enhance his/her working performance", and PEOU as "the degree to which a person believes that using a particular system would be free from efforts" (Davis, 1989).

Although the theory of technology acceptance has been widely used in IS fields, the TAM has disregarded the impact of social variables on the processes of technology acceptance. Therefore, most researches (Taylor & Todd, 1995; Venkatesh & Davis, 2000) indicate that it is necessary to integrate the TAM and other acceptance theories, especially those which include human or social variables, to enhance the predicting and explanatory power in the practice of the acceptance model. Owing to the validity of the TAM for predicting acceptance behavior, this study believes that the application of the TAM in healthcare service is helpful for understanding patients' acceptance of new e-health (Schaper & Pervan, 2007; Zheng et al., 2007).

2.2 Innovation Acceptance Model

The purpose of IAM is to discuss the relationship between different constructs included in the process of "innovative" technology acceptance. In his explorative study, Rogers (1995) indicated three constructs that have significant impact on the process of *innovative* technology acceptance. The first construct is an individual's "innovativeness", that is, "the degree to which an individual adopts new ideas relatively earlier than other members of the social system"; the second construct is "other personal influence"; the final construct is "innovation characteristics," which include several variables, such as relative advantage, compatibility, complexity, trial ability, and observables (Davis, 1989).

Recently, relevant researches focused on developing a more comprehensive acceptance model with higher predicting and explanatory power by integrating the IAM and TAM (Lewis, Agarwal, & Sambamurthy, 2003; Purao & Storey, 2007;). Because Home Telehealth is a "new" healthcare technology that was implemented proactively by the Taiwanese government, this study suggests that the application of the IAM will also be helpful for understanding patients' acceptance of the new e-health system (Tung, Chang, & Chou, 2007).

2.3 Health Belief Model

The two main constructs presenting patients' health behaviors in the HBM are perceived disease threat (PDT) and behavioral evaluation. PDT includes perceived susceptibility (i.e., one's subjective perception of risks from the health environment) and perceived severity (i.e., one's perceived seriousness of diagnosis or of leaving a disease untreated). Behavioral evaluation includes perceived benefits (PB) (i.e., decrease in the risk of diseases and other nonhealth benefits) and perceived barriers to taking action (PBTA) (i.e., negative influences produced by cost or action-related factors) (Rosenstock,1974). Moreover, cues to actions (CUES), which act as the triggers to stimulate people to take action, were also included in the subsequent revised model (Strecher & Rosenstock, 1997) and have been widely used in healthcare fields (Lajunen & Rasanen, 2004; Sun et al., 2006).

Inasmuch as Home Telehealth is a new technology applied in healthcare services, this study suggests that the consideration of the HBM is necessary to enhance the predicting capability of the acceptance model. In summary, this study will develop a unified acceptance model, which can be used to reveal patients' intention to accept and adopt Home Telehealth through the effective integration of the TAM, IAM, and HBM.

3. RESEARCH DESIGN

3.1 The development of research hypotheses

The purpose of this study is to develop a unified acceptance model that can be used to reveal patients' intention to accept and adopt Home Telehealth. Therefore, three models, namely, TAM, IAM, and HBM, were first integrated, and the moderators that can enhance the predicting power of the acceptance model were then included. The unified acceptance model is shown in Figure 1. Each hypothesis is illustrated as follows:

According to the TRA by Fishbein and Ajzen (1975) and the TAM by Davis (1989), if an individual has positive attitude toward using technology, his/her BI will be increased. Hence, this study proposes the following hypothesis:

H1: An individual's ATT has direct and positive impact on BI with respect to Home Telehealth.

Based on both the TAM and IAM, the higher an individual's PU (or relative advantage) toward technology, the stronger his/her ATT. Moreover, the HBM indicated that an individual's PB also has

positive impact on ATT (Rosenstock, 1974). Hence, this study proposes the following hypothesis:

H2: An individual's perceived usefulness and benefits (PUB) have direct and positive impact on ATT with respect to Home Telehealth.

As indicated in the TAM, an individual who has higher PEOU toward technology will not only tend to perceive that this technology is useful, but will also have a stronger attitude toward using it. Hence, this study proposes the following hypotheses:

H3: An individual's PEOU *has direct and positive impact on PUB with respect to Home Telehealth.*

H4: An individual's PEOU *has direct and positive impact on ATT with respect to Home Telehealth.*

As indicated in the HBM, an individual who has stronger perception of susceptibility and severity will increase the possibility of taking action (DeWit, Vet, Schutten, & van Steenbergen, 2005). On the other hand, some negative factors that may influence an individual's behavior (e.g., a high price) will decrease an individual's intention to take action. Therefore, these negative factors are taken as the barriers to actual behaviors; that is, the stronger the perceived barriers, the more difficult for one to take action.

Moreover, the cues to action which are the triggers for taking action can be classified into two types: one is the internal cue (ICUE), such as physical discomfort, appearance of symptoms, etc., and the other is the external cue (ECUE), such as doctor's advice, friends' encouragement, media education, etc. These two have direct positive impact on an individual's attitude towards actual behavior. This viewpoint is consistent with what the TAM indicated that an individual's attitude toward using new technology would positively be affected by other individuals. Hence, this study proposes the following hypotheses:

H5: An individual's perceived disease threat (PDT) (including both perceived susceptibility and severity) has direct and positive impact on ATT with respect to Home Telehealth.

H6: An individual's perceived barriers to taking action (PBTA) have direct and negative impact on ATT with respect to Home Telehealth.

H7: An individual's perceived ECUE has direct and positive impact on ATT with respect to Home Telehealth.

H8: An individual's perceived ICUE has direct and positive impact on ATT with respect to Home Telehealth.

Schillewaert et al. (2005) indicated that an individual's innovativeness(IN) would affect one's adoption of technology. Okazaki (2007) proposed that if an individual's innovativeness is greater, one's intention to use technology would be more positive. Hence, this study proposes the following hypotheses:

H9: An individual's IN has direct and positive impact on ATT with respect to Home Telehealth.

H10: An individual's IN has direct and positive impact on BI with respect to Home Telehealth.

Most related researches indicate that several demographic variables would moderate the structure model. For example, Morris, Venkatesh, and Ackerman (2005) stated that both gender and age differences have significant influences on employee decisions about new technology. Ha, Yoon, and Choi (2007) indicated that the user's age and gender have significant moderating effects on the TAM of mobile game. Hence, this study proposes the following hypothesis:

H11: An individual's gender and age would moderate the acceptance model with respect to Home Telehealth.

In summary, the study proposes the following research model for the mobile healthcare service system.

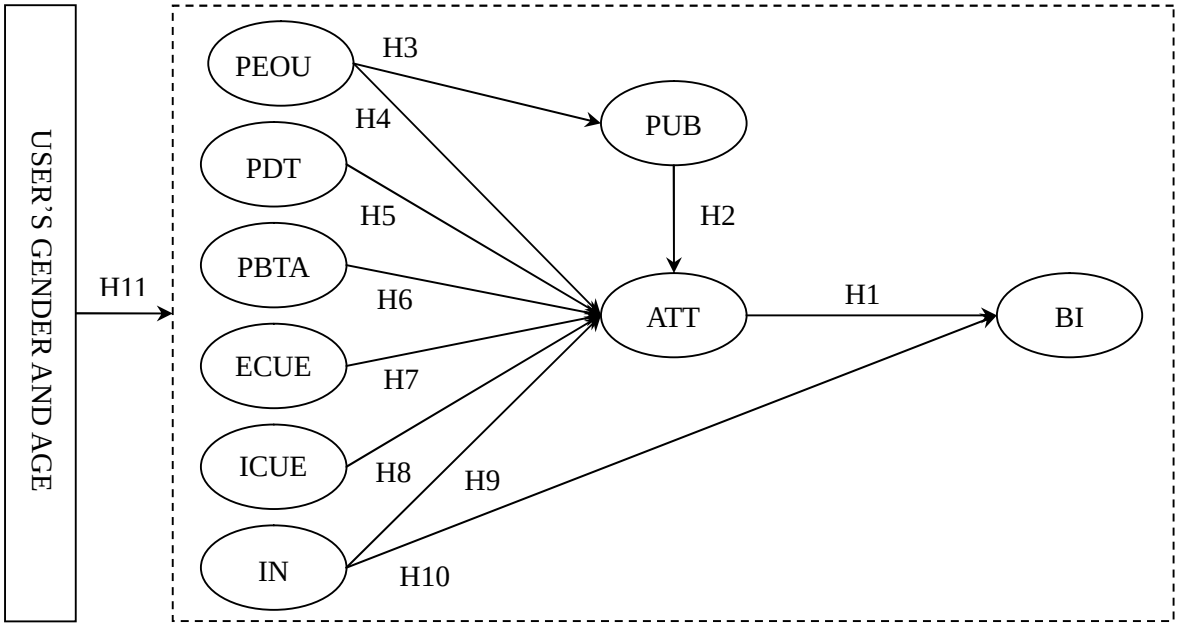

Figure 1 The unified acceptance model of Home Telehealth

3.2 Data collection

The development of Home Telehealth is still in the initial stages in Taiwan, thus the users who understand this new technology and are used to adopting it are few. Therefore, the general public aged over 15 years who have visited "Taiwan International Senior Lifestyle and Health Care (2008 SenCARE)" were selected as the subjects in this study. By convenience sampling method, 500 people were chosen and were asked to fill out questionnaires. Valid questionnaire responses were obtained from 369 persons, 53% of whom were female; 44% were aged over 65, 27% were aged 55–64 and 28% were aged 45–54; most of the questionnaire respondents attended university and graduate school (35% and 18%, respectively).

3.3 Measures of the constructs

Based on the TAM (Davis, 1989; Davis et al., 1989), HBM (Rosenstock, 1974) and IAM (Rogers, 1995), this study selected nine constructs to develop the unified acceptance model for Home Telehealth. These constructs are PEOU, PUB, PDT, PBTA, ECUE, ICUE, IN, ATT, and BI. Their definitions and measures are as follows: PEOU was used to present the user's perceived ease of use of Home Telehealth and was evaluated by four measures; PUB was used to present the user's perceived usefulness of, and benefits from Home Telehealth and was evaluated by five measures; PDT was used to present the user's perceived disease threat and was evaluated by four measures; PBTA was used to present the user's perceived barriers to Home Telehealth and was evaluated by six measures; ECUE was used to present the external social factors, such as doctor's advice on using Home Telehealth and friends' encouragement or support for using Home Telehealth, and was evaluated by six measures; ICUE was used to present the internal social factors and was evaluated by a single measure (i.e., the frequency of disease in the last three months); IN was used to present the user's innovativeness with respect to Home Telehealth and was evaluated by three measures; ATT was used to present the user's attitude towards using Home Telehealth and was evaluated by three measures; finally, BI was used to present the user's behavioral intention to use Home Telehealth and was evaluated by four measures. For each measure, a five-point Likert scale was adopted where the scores 1 to 5 were equivalent to "extremely disagree", "disagree", "commonly", "agree", and "extremely agree, respectively.

3.4 Data analysis methods

First, confirmatory factor analysis was used to examine the reliability and validity of the measurement models, and then structural equation modeling (SEM) was employed to interpret the structural model, making use of LISREL 8.8 as the instrument for information analysis. Each of the impact coefficients was estimated using the maximum likelihood method, while the model's overall fit used the following

indicators: chi-square statistic/degrees of freedom (χ2/df), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normalized fit index (NFI), and root mean square error of approximation (RMSEA). Furthermore, multiple-group SEM analysis was employed to identify whether "user gender" and "user age" moderated the relationship among the constructs used in this study.

4. RESULTS

4.1 Reliability and validity of the measurement model

Except for ICUE, this study used multiple items to present the latent constructs (i.e., PEOU, PUB, PDT, PBTA, ECUE, IN, ATT, and BI) using a structured questionnaire. First, the goodness-of-fit indices suggested that the measurement model was a good fit to the data (see Table 1). Each latent construct was then tested for internal consistency using Cronbach's alpha and construct reliability. The alpha coefficients ranged from 0.78 to 0.92, while the construct reliabilities ranged from 0.78 to 0.93. This indicated a higher internal consistency of measurement indicators; hence, the reliability of each construct was ensured (Nunnally, 1978; Bagozzi & Yi, 1988).

Table 1. Fit indices for the measurement and structural models

Fit indices	Recommended value	Measurement model	Structural model
GFI	≥ 0.9	0.85	0.84
AGFI	≥ 0.8	0.82	0.81
NFI	≥ 0.9	0.98	0.98
RMSEA	≤ 0.1	0.057	0.058
$\chi^2/d.f.$	≤ 3	2.21	2.27

Next, convergent validity and discriminant validity were assessed. The standardized factor loadings ranged from 0.52 to 0.90 and were statistically significant at $p<0.05$. Therefore, convergent validity of the measurement indicators was supported. Discriminant validity test was performed to establish the distinction among the constructs used in this study. Thus, this study followed the method suggested by Hair et al. (2006) by pairing these two latent constructs and subjecting them to two models of CFA. This study then used the chi-square difference test to compare the first model with the second model. The results indicated that all of the chi-square difference values were statistically significant at $p<0.05$. Hence, the discriminant validity is supported.

4.2 Structural model

The SEM technique was used to interpret the unified model (as illustrated in Figure 1). According to the analyzed results (see Table1), the overall fit indices of the model were all found to be within acceptable scope, suggesting that the model was a good fit to the data.

Table 2 summarizes the results of standard path coefficient for each hypothesis. It is obvious that there are only four hypotheses that can be supported: ATT has significantly positive impact on BI (λ = 1.06**); PEOU has significantly positive impact on PUB (λ = 0.99**); IN has significantly positive impact on ATT (λ = 0.57**); and PBTA has significantly negative impact on ATT (λ = -0.13**). However, the R^2 value of the unified model is 0.97 (> 0.5), showing that the unified model had good explanatory power.

Table 2 The results of SEM and multiple-group analysis for the user gender groups

Hypothesis	Unified model	Unstandardized path coefficient		$\Delta\chi^2$	Unstandardized path coefficient		$\Delta\chi^2$
	Standardized path coefficient	Male (n_1 = 173)	Female (n_2 = 196)		< 45 years old (n_1 = 184)	> = 45 years old (n_2 = 185)	
H1: ATT→BI	1.06**	0.74**	1.06**	1.05ns	1.22**	0.64**	6.26**
H2: PUB→ATT	-0.21ns	0.07ns	-0.21ns	0.58ns	0.27ns	0.81ns	0.94ns
H3: PEOU→PUB	0.99**	0.91**	1.02**	0.34ns	1.05**	0.91**	5.05*
H4: PEOU→ATT	0.59ns	-0.06ns	0.36ns	2.79ns	0.36ns	-0.80ns	1.16ns
H5: PDT→ATT	-0.02ns	-0.04ns	0.33ns	3.87**	0.11ns	-0.31ns	0.06ns

H6: PBTA→ATT	-0.13**	-0.29**	-0.25**	0.31ns	-0.16ns	-0.26**	3.31*
H7: ECUE→ATT	-0.02ns	-0.2ns	0.50*	6.01**	0.12ns	0.17ns	0.69ns
H8: ICUE→ATT	0.03ns	0.05ns	-0.01ns	1.52ns	0.02ns	0.04ns	0.08ns
H9: IN→ATT	0.57**	1.47**	0.21ns	4.27**	0.68**	1.11*	0.11ns
H10: IN→BI	-0.08ns	0.39**	-0.11ns	260.5**	-0.39**	0.48**	5.50**
R^2	*0.97*	*0.98*	*0.97*		*0.99*	*0.985*	

Note 1: $\Delta\chi^2$ is the testing statistics used to test if the path coefficients of the two groups are the same with one degree of freedom. Note 2: **: $p < 0.05$; *: $p < 0.1$; ns: $p > 0.1$.

4.3 Moderating effect

To examine whether "user gender" and "user age" have moderating effects on the unified model of Home Telehealth, a series of multiple-group analyses was employed by using LISREL 8.8 to examine whether different gender groups (or different age groups) have different path coefficients of the structural model (Byrne, 1994). These results are presented in Table 2. As shown in Table 2, four relationships are moderated by the variable of user gender (i.e., PDT→ATT, ECUE→ATT, IN→ATT, and IN→BI). As for PDT→ATT, the path coefficients of the two groups are nonsignificant. However, according to the estimated path coefficient, the female group displays higher significant influence than the male group ($\Delta\chi^2$ = 3.87**), showing that the female group has stronger ATT than the male group under the condition of stronger PDT.As for ECUE→ATT, the female group has significantly higher influence on this relationship than the male group ($\Delta\chi^2$ = 6.01**). This presents that the females have stronger ATT for Home Telehealth than males, while they receive stronger ECUE. For males, the perceived ECUE would not strengthen their ATT for Home Telehealth. As for IN→ATT, the male group has significantly higher influence on this relationship than the female group ($\Delta\chi^2$ = 4.27**). This presents that the males have stronger ATT for Home Telehealth than females, while they have stronger innovativeness. For females, innovativeness is not an antecedent for strengthening their ATT for Home Telehealth. Finally, for IN→BI, the male group has significantly higher influence on this relationship than the female group ($\Delta\chi^2$ = 260.5**). This presents that the innovativeness of Home Telehealth is an antecedent for strengthening BI for males, but not for females. Moreover, the R^2 values of the unified model on males and females are 0.98 and 0.97, respectively, demonstrating that user gender is a moderating factor, which can enhance the predicting power because the R^2 value of the female group is higher than the unified model on the overall samples.

In this study, we classified the samples into lower-age group (< 45 years old) and higher-age group (> = 45 years). Results show that there are also four relationships being moderated by the variable of user age (i.e., ATT→BI, PEOU→PUB, PBTA→ATT, and IN→BI). As for ATT→BI, the path coefficients of the two groups are significant while the lower-age group has a significantly higher influence on this relationship than the higher-age group owing to the estimated path coefficient ($\Delta\chi^2$ = 6.26**). This presents that the lower-age user has stronger BI than the higher-age user does, under the condition of stronger ATT. Similarly, for PEOU→PUB, the path coefficients of the two groups are significant, while the lower-age group has significantly higher influence on this relationship than the higher-age group ($\Delta\chi^2$ = 5.05*) does. This presents that the lower-age user has stronger PUB than the higher-age user does, while they perceive PEOU for Home Telehealth. For PBTA→ATT, the higher-age group has significantly higher influence on this relationship than the lower-age group does. Because the path coefficient is negative, this shows that the PBTA of Home Telehealth is an antecedent for decreasing the ATT for higher-age users, but not for the lower-age users. Finally, for IN→BI, the path coefficients of the two groups are significant. However, it is notable that the path coefficient of the higher-age group is positive, while that of the lower-age group is negative. This implies that the increase of IN would strengthen the BI of Home Telehealth for higher-age users, while it would decrease the BI of Home Telehealth for the lower-age users. Moreover, the R^2 values of the unified model on the sample with the lower-age group and higher-age group are 0.99 and 0.985, respectively, demonstrating that the user age is a moderating factor, which can enhance the predicting power since the R^2 value of both groups are higher than the unified model on the overall samples.

5. DISCUSSION AND CONCLUSION

Owing to the special phenomena of the aging population structure and the increasing number of chronic diseases, *Home Telehealth* has become one of the important projects of the newly developing service industry in Taiwan since 2008. However, the development of such healthcare technology is still in the initial stages. Thus, understanding the people's intention to use this technology is of greater importance for the government and hospitals at this early stage. This study, therefore, developed a unified model by integrating the TAM, IAM, and HBM with moderators (i.e., gender and age) to reveal the intention to accept and adopt Home Telehealth.

The results show that IN has significantly positive impact on ATT, while PBTA has significantly negative impact on ATT. This demonstrates that two ways to strengthen users' attitude toward using Home Telehealth are to increase the users' innovativeness and to decrease the perceived barriers to the use of this new healthcare technology. Therefore, for both the Taiwanese government and hospital managers, emphasizing on simplifying the use while developing the Home Telehealth system is necessary to avoid users' resistance to adopting the new technology. Moreover, delivering the information to the public of the potential benefits of using Home Telehealth through appropriate propaganda or education is also a critical way to increase users' acceptance of adopting the new technology. The results also show that ATT has significantly positive impact on BI, demonstrating that users' attitude is a key antecedent for users' intention to use the system. In short, ATT is a mediator in the relationship between IN/PBTA and BI.

Moreover, this study presents that PEOU has significantly positive impact on PUB, while PUB does not influence the users' ATT (see Hypothesis 2). Although the positive relationship between PEOU and PUB was supported in this study, an increase in these two constructs would not affect the users' ATT and BI for Home Telehealth. Therefore, this study suggests that IN and PBTA are key factors if the government and managers are to strengthen users' attitude and thus increase their intention of using Home Telehealth.

Furthermore, this study also explores the moderating effects of gender and age variables on this unified model. The results show that both gender and age variables are moderators of this unified model. For gender, it is interesting to note that: (1) the relationship between PDT and ATT, and ECUE and ATT became stronger for the female group; especially, the path coefficient of ECUE→ATT became significant for the female group; while (2) the relationship between IN and ATT, and IN and BI became stronger for the male group; especially, the path coefficient of IN→BI became significant for the male group. This implies that for different gender groups, the government or managers should provide different incentives to enhance their attitude toward using Home Telehealth. For example, ECUE has significantly positive impact on ATT merely for the female group. Therefore, doctor's advice, friends' encouragement or support, and education are all effective ways to heighten females' attitude toward using Home Telehealth. For males, increasing innovativeness has a positive effect not only on ATT but also on BI, demonstrating that strengthening their innovativeness is necessary for driving Home Telehealth effectively.

Next, as for the age variable, the relationship between ATT and BI, and PEOU and PUB became stronger for the lower-age group; while the relationship between PBTA and ATT became stronger for the higher-age group; especially, the path coefficient of PBTA→ATT became non-significant for the lower-age group. This implies that users in the higher-age group easily encounter barriers when they use the new healthcare service system; therefore, simplifying the use and decreasing the switch costs of adopting the new technology system to change the users' attitude are highly important for the Taiwanese government and hospital managers to advance Home Telehealth. Finally, it is interesting to find that the most significant difference between these two groups is the relationship of IN and BI because the path coefficient is significantly negative for the lower-age group, while it is significantly positive for the higher-age group. A possible reason for this negative impact is that low-age users have more knowledge and experiences in adopting IT or IS, thus they are more strict about the completeness of the systems. However, the development of Home Telehealth is still immature, making it easy for low-age users to select other ways that could substitute for Home Telehealth.

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計畫成果自評

本計畫的主要目的是整合健康信念模式、科技接受模式及創新接受程度於建構遠距居家照護科技接受行為之預測模式，並透過民眾之性別與年齡的干擾效果的探索以提升此預測模式之預測能力，以期做為未來醫療科技照護產業之有效推動與發展之依據。研究結果顯示，首度整合一般資通訊科技之接受模式中所常見之 TAM 及 IAM 兩模式對遠距居家照護系統之接受模式中仍具有顯著之解釋力，另外，研究更發現以醫療照護為核心之遠距居家照護系統，若能整合以病患健康行為接受模式常用之 HBM，將更能清楚瞭解提升使用者對系統態度及使用意願的因素，進而更有效推動遠距居家照系統，因此建議，若相關單位在推動科技功能結合醫療照護時，欲了解使用者之接受行為模式時，可將一般資通訊科技接受模式常用之 TAM 及 IAM 以及醫療健康接受模式常見之 HBM 模式整合並考量使用者之性別與年齡的干擾因素，以建立更完備之資通訊科技於醫療照護上之服務系統的接受模式。由此可知，計畫結果能確實達成原申請計畫之主要目標。

此外，本計劃之主要學術貢獻包括下列四點：一、了解目前醫療照護產業之趨勢與台灣遠距居家照護之內容。二、此研究是以使用者（病人）觀點，並首度結合一般常用於資通訊科技之科技接受模型、創新接受模型以及健康行為之健康信念模型及來發展一整合且更具全面性之遠距居家照護科技接受模型，此結果可以提供給相關研究者、醫療照護科技發展者及政策擬定者參考。三、計畫中更討論分析干擾醫療照護科技接受模型之影響因素，並此結果可提供做為未來醫療照護產業於發展市場區隔之依據。四、此研究結果目前已撰寫成學術論文(Lin, Chan, and Huang, 2009)，並於 *The 2009 International Conference in Management Science and Decision Making*, Taipei, Taiwan 中發表，並更進一步作修改後投稿於國際期刊中。

本計劃之管理貢獻包括下列三點：一、提供給國家推動醫療照護科技單位之政策制訂者，了解影響醫療科技照護產業成功的關鍵影響因素。以期能在2010年時能有超過9百億之商業機會二、提供遠距居家照護產業業者，發展更適合使用者之遠距居家照護產品，更可提供業者在遠距居家照護之市場區隔。三、藉由研究結果提供給政策制訂者及醫療照護科技發展者，可以提升民眾高品質、有效率、可近性與獨立性之健康照護。。

另外，參與本計畫之學生有科管所博士生詹雅慧及碩士生林郁真，在此計畫的過程中，兩位學生學習到量化研究之相關研究歷程，如文獻評析、抽樣設計、問卷設計、資料蒐集等，並學會如何應用多變量統計方法於結合行為理論、健康照護行為及創新理論模式於科技時代下醫療照護科技領域上之研究上以及學會利用LISREL與SPSS兩種統計軟體，其中林郁真同學將此量化研究的經驗應用於其碩士論文上，詹雅慧同學更於國際研討會投稿的經驗中，學習英文寫作以及英文簡報。