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An Empirical Study on Patients' Acceptance and Resistance Towards Electronic Health Record Sharing System: A Case Study of Hong Kong

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ABSTRACT

This article aims at identifying significant factors influencing behavioural intention and resistance of patients toward electronic health record sharing systems by using PLS-SEM. A questionnaire was selected as the major data collection method and 243 responses were collected. Thus, this paper reviewed different theoretical models to illustrate the factors which influence the behavioural intention of patients towards the usage of the system and to identify the most important factors for acceptance and resistance of patients' respectively. The responses were then divided into two groups, specialist patients and normal patients, which had the common factors including performance expectancy and effort expectancy. For specialist patients, transition costs were identified as the only factor significantly affecting resistance to use. For normal patients, sunk costs and regret avoidance were found to be positively correlated with resistance to using of normal patients.

KEYWORDS

Electronic Health Record Sharing System, Empirical Study, Smart-PLS, Structural Equation Modelling

1. INTRODUCTION

Adopting electronic health record (eHR) has been a global trend due to more advanced technology. In most of the European countries, eHR systems have been widely used in healthcare organisations in order to promote health care delivery and integrated services with high-quality efficiency (Adler-Milstein, Ronchi, Cohen, Winn & Jha, 2014). Some of the countries like Finland have decided to extend the usage of eHR and document patient data in a structured form centralised at one platform. Progress from a local Information System (IS) to a national one is developed (Vuokko et al., 2017).

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An Electronic Health Record Sharing System (eHRSS) provides a platform for healthcare providers in both the public and private sectors, with the record in the electronic format of patients (Food and Health Bureau, 2016). The electronic health record (eHR) includes health-related data that is not confined to medical treatment for illness, as well as the data stored and retrieved by different healthcare providers for health care-related purposes. In Hong Kong, it usually creates and keeps health-related and medical data in paper form. Although there are some healthcare providers may have an electronic medical or patient record system to keep the data, the system can only be used in the corresponding organisation. It is not able to share those data at large scale with other healthcare providers whenever the patients go to other hospitals or clinics.

To provide more accurate medical records for healthcare providers as well as enable efficient clinical practice, the development of eHRSS has been started since 2008. The first stage of eHR Program was implemented from 2009 to 2015 as a sharing pilot called "Electronic Patient Record (PPI-ePR)". Patients who are interested in joining the program have to submit their application online or in person, which means that they agree to let private healthcare provider registered in this program views the patient's clinical record online. Each patient who has registered will be given a personal identification number. According to the Hospital Authority (2016), there are more than 485,000 patients and 3,500 private healthcare professionals have been enrolled in the PPI-ePR pilot up to January 2016. In the March of this year, eHRSS is launched and the registration of PPI-ePR is no longer accepted. The patients are required to submit a new application.

Data privacy and security of the eHRSS are of paramount importance, which is given legal protection. "Electronic Health Record Sharing System Ordinance" is effective from December 2, 2015 for the establishment of eHRSS. It provides a legal base to protect the system, data as well as information (Food and Health Bureau, 2016). The system provides a secure and stable platform to allow the registered private healthcare providers are accessing to eHR with the patients' consent. Besides, the registration of eHRSS is completely voluntary participation. There are two options including indefinite sharing consent and one-year sharing consent for patients when they decide to participate in eHRSS. Indefinite sharing consent is valid without time limit while the valid time of one-year consent is one year from the date of patient's registration. Consent is valid until revocation by the patient registration withdrawn or cancelled. In addition, only patients' data which are within the scope of sharable eHR will be uploaded to the system and accessed by the clinicians on the need-to-know basis.

An information infrastructure is provided for the healthcare providers via eHRSS. With the consent of patients and authorisation for access to the system, the eHR of patients can be retrieved by the healthcare professionals in both the public and private healthcare sectors, which may be shared by other healthcare professionals (Food and Health Bureau, 2016). The eHR systems have already been used in healthcare organisations in most European countries (Codagnone & Lupiañez-Villanueva, 2013). In Hong Kong, however, it is still a long way to go to make eHRSS as a territory-wide application.

The healthcare-related system applies to cloud computing to enable a ubiquitous and convenient service to access data resources (Liu et al., 2016). Data access and storage services without limitation of physical location are provided through cloud computing. Management effort is minimised by providing rapid and elastic services, and hence, health cloud increases the business flexibility of hospitals in both public and private sector (Mathew, 2013). Traditionally when people are sick and go to see a doctor, the doctor is required to check their body's state and previous medical records carefully. This process is time-consuming. It is common for a patient who goes to the public hospital to spend few hours to finish the whole process and collect medicines. Nevertheless, with the health cloud platform, Big Data capture, storage, index and visualisation of data for various stakeholders are facilitated (Mahmud, Iqbal & Doctor, 2016). Also, cost and time are saved by preventing overlapping treatment or body checking process. Health cloud brings lots of benefits to the healthcare industry. However, security and privacy are one of the main reasons to hesitate to widely share sensitive information in the health cloud (Wang, et al., 2016).

With the problem of ageing population in the society, the demand for the healthcare services is rising, particularly among the elderly. The participants may not be familiar with technology due to the lack of ICT knowledge. Although their family member or guardian can register the program, the absence of motivation may be one of the reasons for them not to apply to the patients still can use healthcare services even though they do not register eHRSS. Therefore, the resistance to technology may have a significant impact on the patients' attitudes towards eHRSS. Probably there are some other factors adversely influencing patients' behaviour, it is critical to understand the factors so that eHRSS can be promoted in other possible ways and be widely used in Hong Kong in the future. Nevertheless, the lack of resistance does not mean that the usage of eHRSS would be enhanced. It is also necessary to study the patients' acceptance towards the program, which motivates them to be one of the users.

2. THEORETICAL BACKGROUND AND MODEL DEVELOPMENT

2.1. Reivew of Related Theories and Models

2.1.1. Theory of Reasoned Action

Theory of Reasoned Action (TRA) is a fundamental and influential theory that is able to explain human behaviour in the field of social psychology (Chen et al., 2012). TRA suggests that intention of individuals determines the behaviour that he or she performs, which is affected by the attitude toward particular behaviour and subjective norms (Fishbein & Ajzen, 1977). Attitude refers to the individual's positive or negative view to perform a behaviour. It can be influenced by the expectation and evaluation of a specific outcome. Subjective norm refers to the social pressure that the society put on him or her to perform a behaviour (Fishbein & Ajzen, 1977). There are numerous studies among different fields apply TRA to explain human behaviour, while some of them are able to explain user's behavioural intention toward using IS (Sheppard, Hartwick & Warshaw, 1988; Davis, 1989; Davis et al., 1992). Davis (1989) suggested that perceived usefulness and perceived ease of use are the variables which affect user acceptance when they use new information technology.

2.1.2. Technology Acceptance Model

Davis (1989) adopted the TAM to IS and developed TAM to explain users' intention to use the technology. TAM mentions that the user's behavioural intention to use the technology directly determines user acceptance of that technology (Davis, 1989). Also, the model indicates how two main determinants, which are perceived usefulness and perceived ease of use, are affected by the external variables (Ifinedo, 2016). According to David (1989), perceived usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her job performance", while perceived ease of use refers to "the degree to which a person believes that using a particular system would be free from effort". Both of these determinants pose positive effect on feelings of people toward demonstrating certain behaviour (Ifinedo, 2016). Simplicity and parsimony are advantages of TAM (Lee & Ryu, 2013). Many researchers have used TAM to explain and even predict users' acceptance of learning new technology, such as email, Web 2.0 and blogs usage (Gefen & Straub, 1997; Chang et al., 2015; Hsu & Lin, 2008). Perceived usefulness and perceived ease of use can be interpreted as performance expectancy and effort expectancy in the UTAUT.

2.1.3. Social Cognitive Theory

Social Cognitive Theory (SCT) is proposed by Bandura (1986) to explain user behaviour regarding social, psychological or personal factors. In other words, users' social interaction with others, feelings and thoughts determine their behaviours. SCT has been applied in various fields including psychology, education and IS, which focuses on the learning processes that a person performs the certain behaviour (Ifinedo, 2016). For example, perceived self-efficacy, personal outcome expectations and perceived

support for enhancing social ties are the considered as the significant factors for continued blogs use of undergraduate students (Ifinedo, 2016).

2.1.4. Theory of Planned Behaviour

The Theory of Planned Behavor (TPB) indicates that an individual's attitudes toward the behaviour, subjective norms and perceived behavioural control shape his or her intention to engage in a behaviour, and hence affect his or her actual behaviour (Ajzen, 1991). The origin of perceived behavioural control is the Theory of Achievement Motivation introduced by Atkinson (1964), which refers to the degree of which an individual expect they will succeed or they are able to control their success. Researchers may think that the concept of perceived behavioural control is similar to that of perceived self-efficacy (Londono, Davies & Elms, 2017). Despite TPB has been used in many studies, it has some limitations. For instance, self-report bias is one of the weaknesses of TPB (Armitage & Conner, 2001). Londono et al. (2017) suggest that the efficacy of TPB model could be improved by considering emotions when the nature of the situation is related to emotional implications.

2.1.5. Motivational Model

Motivational Model (MM) provides a persuasive explanation for an individual performing a behaviour with motivation theory. It posits that motivation can be classified into two categories which are extrinsic motivation and intrinsic motivation. According to Davis et al. (1992), the extrinsic motivation is the perception that an individual wants to perform a behaviour if he or she thinks "it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself", while intrinsic motivation emerges "for no apparent reinforcement other than the process of performing the activity". The theory of MM is quite similar to perceived usefulness mentioned in TRA and TAM.

2.2. Theoretical Model for Patient's Acceptance and Resistance Towards eHRSS

Previous research focuses on only one of the theories that explain behaviours of people. Hsieh (2016) studied patient's acceptance and resistance to the health cloud in Taiwan in the dual factor perspective, the background of the health cloud studied is distinct from eHRSS in Hong Kong as the public does not require to register in the system themselves. It means that the registration of the health cloud is not voluntary. Also, in Hong Kong, the usage of eHR is still in the beginning stage. It is important to study the view of the society to assist the promotion of eHRSS. Therefore, the paper included a hypothesis model shown in Figure 1. Table 1 summarizes the meaning of variables in the hypothesis model.

Figure 1. A theoretical model for patient's acceptance and resistance towards eHRSS

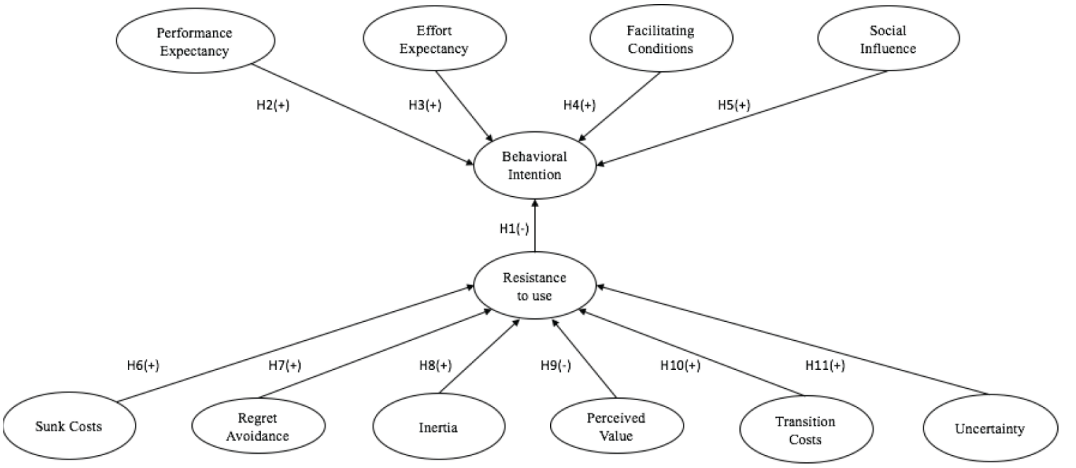


Table 1. Explanation of the variables in the hypothesis model

Determinants	Explanation
1. Performance expectancy	The degree to which an individual thinks that he or she could have better job performance with the help of the system
2. Effort expectancy	Ease of use of new technology that an individual expects
3. Facilitating conditions	The degree to which the user believes that the infrastructure of the new technology or an organisation is able to support his or her to use the system
4. Social Influence	The degree to which the surroundings affect the perceived importance of an individual to use the system
5. Sunk costs	Investment in time and effort in the new alternative
6. Regret avoidance	The intention of people who tend not to switch to the new system in order to avoid regret
7. Inertia	A feeling that people want to keep everything under control and hence prevent from changing
8. Perceived value	The degree to which an individual thinks that the costs which are incurred due to the new technology implementation are worthy of the benefits derived
9. Transition costs	Transient costs and permanent costs brought by switching from a status quo to adopt a new technology, which could be time, money, learning costs, more effort because of the poor system quality and perceived threats time
10. Uncertainty	A situation which could not be predicted and may bring negative outcomes, such as leakage of personal information.

2.2.1. Technology Acceptance and Resistance

Implementation of the new technology may bring lots of advantages to the society. eHRSS is one of the examples which helps to facilitate diagnosis of patients and the quality of healthcare service in Hong Kong. Nevertheless, resistance or non-acceptance of new systems by users may cause many failures of implementation efforts (Joshi, 2005). Bhattacherjee and Hikmet (2007) suggested that resistance not necessarily mean to non-usage as non-usage may imply that there are potential adopters who are unaware of a new technology or are still evaluating the technology before adopting it. They also mention that resistance to use affects the IS usage adversely. Hence, Nilsen et al. (2016) studied the resistance to implementation of welfare technology in healthcare services, while Norzaidi et al., (2008) suggested that the users may eventually use the new system despite they refused to use it in the beginning when they have no other alternatives.

Status qQo Bias (SQB) theory explains the reason why people resist to use new technology can be the bias or preference to maintain the current situation (Kim & Kankanhalli, 2009). People tend to display a bias toward stay with the status quo when they are required to choose among alternatives. Samuelson & Zeckhauser (1988) suggested that psychological commitment, cognitive misperceptions, and rational decision making are possible to explain the bias which is substantial in important decisions.

Thus, patients are compelled to use eHRSS if it is mandatory for them to register as the participants of the program. For example, if the government requires all the hospitals and clinics replace traditional paper documentation with online information sharing platform, the patients have no choice but agree to share their medical record via the new system. Moreover, the prior bad experience may lead to user resistance to the usage. Therefore, the following hypotheses are proposed according to the above literature:

H1: Resistance to use has a negative effect on the behavioural intention.

2.2.2. Dual Factor Theory

Herzberg et al. (1996) propose a dual factor theory which suggests people have two sets of needs. They found that job satisfaction and dissatisfaction are determined by two different sets of the factors respectively. The findings implied that when the factor which leads to dissatisfaction is satisfied, it does not cause satisfaction. In addition, Cenfetelli (2004) also mentions that an idea that while enablers regarding the design and functionality of are the best predictors for IS adoption, inhibitors are likely to be the best predictors for IS rejection. The presence of inhibitors may discourage IS usage, but the absence of them does not necessarily encourage adopting technology (Cenfetelli, 2004). Furthermore, Gatignon and Robertson (1989) clarified that the behaviour of people who decide to reject is not explained by the factors which explain adoption. Two separate groups of factors are independent of one another. Last but not least, Ram (1987) noted that the obverse of innovation adoption is not innovation resistance, so resistance and adoption can coexist throughout the lifecycle of innovation. Therefore, besides considering factors which lead to adopting the new technology, it is necessary to consider inhibitors which cause patients' rejection to eHRSS simultaneously.

2.2.3. Customer Loyalty

Venkatesh et al., (2003), explained eight research models and theories to explain individual acceptance and behaviors, including theory of reasoned action (Fishbein & Ajzen, 1977), Technology Acceptance Model (TAM) (Davis, 1986), social cognitive theory (Bandura, 1986), Theory of Planned Behavior (TPB) (Ajzen, 1991), the model of personal computer utilization (Thompson et al., 1991), motivational model (Davis et al., 1992), combined TAM-TPB (Taylor & Todd, 1995) and innovation diffusion theory (Rogers, 1995). More details of some of the theories and models will be discussed in the later part.

The latest theoretical model is proposed by Venkatesh et al. (2003), which is called Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT is a unified model with four key determinants of usage intention and behaviour, which include performance expectancy, effort expectancy, social influence, and facilitating conditions. According to Venkatesh et al. (2003), performance expectancy is defined as the degree to which an individual thinks that he or she could have better job performance with the help of the system. Effort expectancy is defined as the ease of use of the new technology that an individual expects. The individuals tend to have greater acceptance when the IS usage is beneficial to their tasks, and little effort is cost by them. It is highlighted that effort expectancy is influenced significantly by self-efficacy (Schaper & Pervan, 2007). Thus, performance expectancy and effort expectancy is considered as the determinants that positively affect behavioural intention. Besides, social influence is defined as the degree to which the surroundings affect the perceived importance of an individual to use the system. Facilitating conditions are defined as the degree to which the user believes that the infrastructure of the new technology or an organisation is able to support his or her to use the system (Venkatesh et al., 2003). In addition, Ajzen (1985) mentioned that facilitating conditions describe an individual's perception of the availability of knowledge, resources and the chances needed for using the new technology. Šumak and Šorgo (2016) provided evidence to support that facilitating conditions and social influence positively affect the behaviour intention of using the new application.

Numerous researchers adopt the model of UTAUT, and it shows that UTAUT mode is effective in explaining the behavioral intention of IT usage. Cimperman et al., (2016) analysed the elderly's acceptance towards home telehealth services by applying UTAUT model and Escobar-Rodríguez & Carvajal-Trujillo (2014) applied the same model to examine the determines of purchasing tickets online for low-cost carriers. Thus, this study will study the patient's behavioural intention to use eHRSS with UTAUT model, and the following hypotheses are formulated:

H2: Performance expectancy has a positive effect on the behavioural intention.
H3: Effort expectancy has a positive effect on the behavioural intention.

H4: Facilitating conditions have a positive effect on the behavioural intention.
H5: Social influence has a positive effect on the behavioural intention.

2.2.4. Psychological Commitment

Psychological commitment explains the presence of sunk cost, regret avoidance and drives for consistency. Li et al., (2016) focus on social norms, which refer to the cultural products such as values, customs, and traditions, as the psychological commitment to their study. Furthermore, the larger investment in time and effort in the new alternative, the greater degree of status quo bias is induced (Samuelson & Zeckhauser, 1988). Development of inertia is encouraged by the perceived sunk costs, which make people tend not to switch to the new system in order to avoid regret and feel in control, and hence they prevent from changing (Polites & Karahanna, 2012). People are likely to feel more regret when the new technology brings a bad outcome than the bad outcomes caused by the status quo (Kahneman & Tversky, 1979).

Patients may consider possible costs brought by registration of eHRSS, and they may choose to remain everything unchanged rather than taking the risk to use new technology. The resistance to use is also resulted due to regret avoidance. Also, the decision maker may be affected by what others do and what others think that they should do. Therefore, the following hypotheses are proposed:

H6: Sunk costs have a positive effect on the resistance to use.
H7: Regret avoidance has a positive effect on the resistance to use.
H8: Inertia has a positive effect on the resistance to use.

2.2.5. Cognitive Misperception

According to Kim and Kankanhalli (2009), cognitive misperception is resulted because of the presence of perceived value and inertia. The first research discussing the bias that the individuals weigh losses heavier than potential gain is proposed by Thaler (1980). In addition, Kim and Kankanhalli (2009) mentioned that perceived value indicates whether the costs that are incurred due to the new technology implementation are worthy of the benefits derived. In their study, perceived usefulness and perceived ease of use are involved, which are found to be one of the crucial factors that influence the users' resistance to using a health IT application. According to Hsieh (2016), perceived value shows whether the benefits derived from the decision of adapting to the new situation are more than the costs. Kahneman and Tversky (1984) experimented to verify this bias and label the phenomenon as loss aversion. Hence, the proposed hypothesis is:

H9: Perceived value has a negative effect on the resistance to use.

2.2.6. Rational Decision Making

The theory of rational decision making is first introduced by Savage (1954). Individuals tend to choose the alternatives which offer the greatest expected utility under uncertainty. When the decision is affected by the initial choice, the individual may consider transition costs due to switching from the status quo. Transition costs are further categorised into two subtypes of costs including transient costs that are incurred during the change and permanent costs due to the change, such as learning costs, more effort because of the poor system quality and perceived threats (Samuelson & Zeckhauser, 1988; Markus, 1983; Krovi, 1993). SQB occurs whenever the transition costs are more than the efficiency gain of a superior alternative (Savage, 1972). Transition cost associated with changing the status quo is considered by users and they wish to minimise their expenses (Kahneman, & Tversky, 1979). The users tend to resist to use new technology when the transition costs increase. Furthermore, SQB is likely to be created when an individual has to decide with the presence of uncertainty. He or she

may avoid taking the risk associated with the new alternative. So, users of eHRSS may consider both transition costs and uncertainty before they decide on whether they register in eHRSS. The proposed hypotheses are shown in the following:

H10: Transition costs have a positive effect on the resistance to use.
H11: Uncertainty has a positive effect on the resistance to use.

3. METHODOLOGY

3.1. Data Collection and Sampling

Since the target respondents of this research are patients, the questionnaires were distributed outside clinics and hospitals including Hung Hom Clinic, Tseung Kwan O Jockey Club General Out-patient Clinic, Tseung Kwan O Hospital and Prince of Wales Hospital. To have a more comprehensive understanding of patients' attitude to eHRSS, face-to-face interview allows the interviewer to probe for explanations of each response of interviewees. Also, it is able to identify body language and facial expressions so that misinterpretation of interviewees to the questions may be prevented. A questionnaire is designed based on the hypothesis model and tailor-made for patients in Hong Kong in order to match with the situation of usage of eHRSS in this society. For each variable, three to five questions are set in order to evaluate the relationship between variables. Two response formats for this questionnaire and all questions could be divided into thirteen sections. Both English and Chinese edition of the questionnaire is available, which are with same expression and meaning for each question. Appendix A shows questionnaire according to the hypothesis model.

A total of 300 questionnaires was distributed from February 19, 2017 to March 8, 2017 via the Internet and conducting outside the hospital. The questionnaire was created by using Google Form, and the link was sent to respondents through Facebook, WhatsApp and internet forum. 125 samples were collected in total. Also, outside the clinics and hospitals are locations selected to distribute questionnaires, which include Hung Hom Clinic (50 samples collected during February 23, 2017 to February 25, 2017), Tseung Kwan O Jockey Club General Out-patient Clinic (18 samples collected on February 27, 2017 and 3 March, 2017), Tseung Kwan O Hospital (25 samples collected during March 4, 2017 to March 5, 2017) and Prince of Wales Hospital (25 samples collected during March 7, 2017 to March 8, 2017). The target respondents of this questionnaire are patients who are either required to visit specialist out-patient clinics or not. Sum of 243 samples is collected with a response rate of 81%. Table 2 shows the descriptive statistics of the respondents. All questionnaires collected are qualified for further analysis.

4. RESULTS AND DATA ANALYSIS

4.1. Test of the Measurement Model

SmartPLS was used to evaluate the measurement model regarding item reliability, internal consistency, convergent validity and discriminant validity. Therefore, Standardized Factor Loading, Cronbach's Alpha, Composite Reliability and Average Variance Extracted were computed.

4.1.1. Reliability

Reliability of items was examined by evaluating Standardized Factor Loading of each item with their corresponding latent variable. The loading is the correlation coefficient for the factor and variable. Reliability is considered as acceptable when the loading is greater than 0.7. However, Chin (1998) suggests that it would also be acceptable with the loading of around 0.6 when additional items in the block are there for comparison purpose. In Table 3, it was found that PE4 (0.564), SI3 (0.108),

Table 2. Description of the respondents' characteristics (N=243)

Attributes	Freq.	Percent (%)
Gender		
Male	85	34.98
Female	158	65.02
Age		
20 or below	29	11.93
21-30	112	46.09
31-40	18	7.41
41-50	24	9.88
51-60	34	13.99
60 or above	26	10.70
Education Level		
Secondary School or below	69	28.40
Associate Degree / Higher Diploma	12	4.94
Bachelor's degree	147	60.49
Master's degree	14	5.76
Postgraduate Degree or above	1	0.41
Occupation		
Student	125	51.44
Retirement	77	31.69
Professional	8	.3.29
Employed	33	13.58
Specialist Out Patient		
Do not need to visit specialist outpatient clinic regularly	123	50.62
Visit specialist outpatient clinic regularly	120	49.38
Number of Registration in eHRSS		
A specialist patient has registered in eHRSS	74	30.45
A normal patient has registered in eHRSS	17	7.00
A specialist patient has not registered in eHRSS	46	18.93
A normal patient has not registered in eHRSS	106	43.62
Channel Obtaining Information about eHRSS		
Healthcare Providers	93	28.88
Family	34	10.56
Friends	34	10.56
Mass Media	114	35.40
Internet	39	12.11
Others	8	2.48

I1(0.587), I4_r (0.393), PV3_r (0.415), U3 (0.549) and U4 (0.180) with a standardized factor loading even smaller than 0.6, which did not meet the requirement, while BI3 (0.692) and SC1_r (0.682) with a loading of around 0.6. Other than the above items, item reliability in the research model was supported by the factors extracting enough variance from those variables.

4.1.2. Convergent Validity

Convergent validity is a parameter for measuring the extent to which the items that are theoretically related and are related to reality. It could be assessed based on the values of the Composite Reliability (C.R.) and the average variance extracted (AVE) for each latent variable, which should be higher than 0.7 and 0.5 respectively (Fornell & Larcker, 1981). According to results shown in Table 2, the latent variable of uncertainty did not meet the standard with C.R. of 0.691 and AVE of 0.400. In addition, AVE of inertia and perceived value had only 0.423 and 0.499 respectively. It represents that those variables were not highly correlated with the items designed to measure the related variables. Except for these three variables, the convergent validity of the measurement model was confirmed.

4.1.3. Internal Consistency

Internal consistency of the measurement model was evaluated by Cronbach's Alpha of each latent variable. The value of Cronbach's Alpha was required to be higher than 0.7 to confirm that there was a strong correlation between items designed. It was found that the coefficients computed for inertia (α= 0.530), perceived value (α= 0.498) and uncertainty (α= 0.608) did not meet the requirement. Besides, social influence was with a coefficient of 0.696, which was still considered as acceptable. The overall internal consistency of the measurement model was supported except for the three variables with low alpha value. The summary of the measuring items was shown in Table 3.

4.1.4. Discriminant Validity

Discriminant validity is a subtype of construct validity along with convergent validity. The difference between these two subtypes of validity is that discriminant validity is applied for constructs that could be differentiated easily while convergent validity is for the similar constructs. The discriminant validity could be examined from two aspects. The first aspect is that the square root of the AVE for each latent variable in the model should higher than the correlation between each variable and other variables (Chin, 1998). The second aspect is that the items are required to load higher on the latent variables that they are going to measure than on all other latent variables (Chin, Marcolin, & Newsted, 2003). In this research, the first aspect was focused, and the discriminant validity of the measurement model was generally satisfied as shown in Table 4.

4.2. Structural Model

The SEM model was assessed by computing the standardised beta coefficient (β), significance levels of path coefficients and explanatory power (R^2). First, the measuring items were calculated for all data, then the data were assessed in two distinct groups, which were patients who need to visit specialist out-patient clinic regularly (SOP) and patients who do not need to do so (NSOP). With a higher absolute value of the standardized beta coefficient, the stronger effect is represented. For significance levels, bootstrapping analyses were necessary to obtain a p-value. It is because PLS-SEM is not based on any distributional assumptions, checking significance levels using parametric levels is not applicable (Chin, 2010; Sanchez, 2013). According to Wang and Wallace (2017), there is still no a standard for R^2 value to define whether it is good or not. They then refer to the research of Cohen (1988) who mention that small, medium and large effect size are indicated by R^2 values of 0.02, 0.13 and 0.26 respectively.

Table 3. Confirmatory factor analysis

Internal Consistency	Number of Items	Number of Items Deleted	Standardised Factor Loading	α	C.R.	AVE
Behavioural intentions	3	0		0.757	0.862	0.678
BI1			0.875			
BI2			0.888			
BI3			0.692			
Resistance to use	2	0		0.784	0.901	0.820
RTU1			0.881			
RTU2			0.929			
Performance expectancy	5	1		0.813	0.870	0.576
PE1			0.839			
PE2			0.786			
PE3			0.762			
PE4			0.564			
PE5			0.813			
Effort expectancy	4	0		0.875	0.914	0.729
EE1			0.889			
EE2			0.882			
EE3			0.884			
EE4			0.739			
Facilitating conditions	4	0		0.829	0.885	0.660
FC1			0.806			
FC2			0.902			
FC3			0.813			
FC4			0.719			
Social influence	3	1		0.696	0.705	0.521
SI1			0.750			
SI2			0.994			
SI3			0.108			

continued on following page

Table 3. Continued

Internal Consistency	Number of Items	Number of Items Deleted	Standardised Factor Loading	α	C.R.	AVE
Sunk costs	3	0		0.762	0.865	0.685
SC1 (reverse)			0.682			
SC2 (reverse)			0.863			
SC3 (reverse)			0.920			
Regret avoidance	3	0		0.786	0.874	0.699
RA1 (reverse)			0.788			
RA2 (reverse)			0.914			
RA3 (reverse)			0.801			
Inertia	4	2		0.530	0.734	0.423
I1			0.587			
I2			0.759			
I3 (reverse)			0.786			
I4 (reverse)			0.393			
Perceived value	3	1		0.498	0.733	0.499
PV1 (reverse)			0.709			
PV2 (reverse)			0.907			
PV3 (reverse)			0.415			
Transition costs	4	1		0.814	0.876	0.642
TC1 (reverse)			0.885			
TC2 (reverse)			0.879			
TC3 (reverse)			0.667			
TC4 (reverse)						
Uncertainty	4	2		0.608	0.691	0.400
U1			0.853			
U2			0.734			
U3			0.549			
U4			0.180			

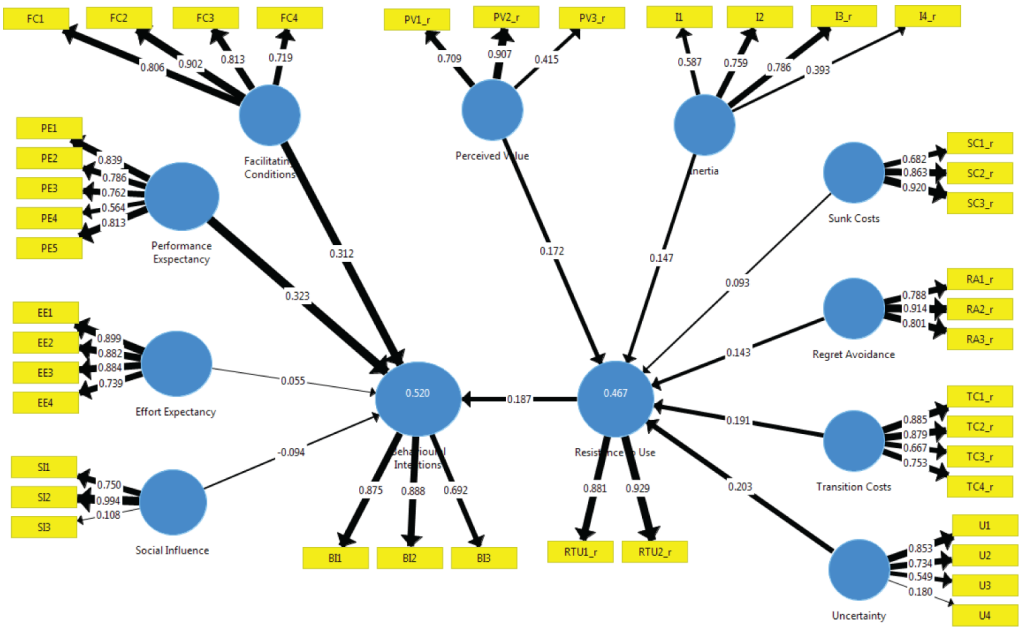
4.2.1. Full Estimates of all Patients

In Figure 2, the path hypothesis H1, H2, H4, H7, H8, H9, H10, and H11 were accepted. It was highlighted that resistance to using ($\beta = 0.187$, $p < 0.01$) is negatively correlated with behavioral intention, while performance expectancy ($\beta = 0.323$, $p < 0.01$) and facilitating conditions ($\beta = 0.312$, $p < 0.01$) are positively correlated with it. Besides, inertia ($\beta = 0.147$, $p<0.01$), regret avoidance ($\beta = 0.413$, $p < 0.05$), transition costs ($\beta = 0.191$, $p < 0.01$) and uncertainty ($\beta = 0.203$, $p<0.01$) are positively related to resistance to use of patients. Only perceived value ($\beta = 0.172$, $p < 0.01$) is

Table 4. Discriminant validity of the measurement model

	1	2	3	4	5	6	7	8	9	10	11	12
1. Behavioural intentions	**0.823**											
2. Effort expectancy	0.451	**0.854**										
3. Facilitating conditions	0.644	0.606	**0.812**									
4. Inertia	0.468	0.309	0.400	**0.650**								
5. Perceived value	0.323	0.348	0.346	0.392	**0.707**							
6. Performance expectancy	0.630	0.464	0.709	0.411	0.217	**0.759**						
7. Regret avoidance	0.260	0.040	0.168	0.310	0.412	0.082	**0.836**					
8. Resistance to use	0.421	0.257	0.366	0.473	0.535	0.307	0.411	**0.906**				
9. Social influence	-0.126	-0.097	-0.011	-0.105	-0.011	-0.031	-0.065	-0.071	**0.722**			
10. Sunk costs	0.464	0.099	0.370	0.499	0.577	0.335	0.513	0.515	-0.054	**0.828**		
11. Transition costs	0.371	0.522	0.449	0.515	0.581	0.266	0.310	0.536	-0.109	0.443	**0.801**	
12. Uncertainty	0.740	0.518	0.695	0.342	0.399	0.703	0.215	0.473	-0.048	0.450	0.408	**0.632**

Figure 2. PLS results of SEM for all patients



negatively correlated to resistance to use. However, H3, H5 and H6 with p-values larger than 0.1 were rejected. In addition, R^2 value for behavioral intentions is 0.520 while the value for resistance to use is 0.467. It was believed that the predictive power of the research model was sufficient. Summary of the hypothesis testing results is shown in the Table 5.

Table 5. Summary of the hypothesis testing results for a full estimate

Hypotheses	β	T-Statistic	P-Value	Significance	Result
H1: Resistance to use → Behavioral intention	0.187	2.655	0.000	<0.01	Accepted
H2: Performance expectancy→ Behavioral intention	0.323	3.917	0.000	<0.01	Accepted
H3: Effort expectancy→ Behavioral intention	0.055	1.486	0.357	N.S.	Rejected
H4: Facilitating conditions → Behavioral intention	0.312	2.277	0.000	<0.01	Accepted
H5: Social influence → Behavioral intention	-0.094	0.159	0.195	N.S.	Rejected
H6: Sunk costs → Resistance to use	0.093	1.626	0.223	N.S.	Rejected
H7: Regret avoidance → Resistance to use	0.413	1.139	0.016	<0.05	Accepted
H8: Inertia → Resistance to use	0.147	1.064	0.005	<0.01	Accepted
H9: Perceived value → Resistance to use	0.172	1.645	0.004	<0.01	Accepted
H10: Transition costs → Resistance to use	0.191	2.638	0.006	<0.01	Accepted
H11: Uncertainty → Resistance to use	0.203	1.293	0.000	<0.01	Accepted

4.2.2. Patients in Two Separate Groups

The data were then divided into two groups and assessed separately. The PLS result of SOP model and NSOP model was shown in Figure 3 and Figure 4 respectively. Appendices 2 and 3 illustrated the bootstrapping results and the parametric test of MGA.

In Figure 3, path hypothesis H1, H2, H4, and H10 were accepted, and the remaining hypotheses were rejected in the SOP model. Resistance to use ($\beta = 0.167$, $p < 0.01$) was negatively correlated with behavioral intention, while performance expectancy ($\beta = 0.385$, $p < 0.01$) and facilitating conditions ($\beta = 0.242$, $p < 0.05$) were positively correlated with it. Only transition costs ($\beta = 0.297$, $p < 0.0.01$) showed positive correlation with resistance to use. Furthermore, behavioral intention had a R^2 value of 0.555 and resistance to use had a value of 0.439 in the SOP model. It was believed that the model was capable of analysing the path hypotheses.

In the NSOP model shown in Figure 4, path analysis H2, H4, H6, H7, H8, H9, and H11 were accepted whereas the rest of the hypotheses were rejected. Performance expectancy ($\beta = 0.293$, $p < 0.01$) facilitating conditions ($\beta = 0.456$, $p < 0.01$) were the influencing factors of behavioral intention same as those in the SOP model. In addition, sunk costs ($\beta = 0.019$, $p < 0.05$), regret avoidance ($\beta = 0.193$, $p < 0.05$), inertia ($\beta = 0.227$, $p < 0.05$), and uncertainty ($\beta = 0.253$, $p < 0.01$) were positively correlated with resistance to use, while perceived value ($\beta = 0.019$, $p < 0.05$) was negatively correlated with it. Nevertheless, since inertia, uncertainty and perceived value were not supported in the stage of evaluating internal consistency, these two factors were not considered.

Besides, a summary of the results of SOP and NSOP was illustrated in Table 6. The estimate coefficients different between two groups were assessed. It was found that there was a significant difference in H3 and H10, in which relationships between behavioural intention and effort expectancy ($\beta = 0.273$, $p<0.1$), and between resistance to use and transition costs ($\beta = 0.191$, $p < 0.5$) were involved. Last but not least, R^2 value for behavioral intentions and resistance to use in the NSOP model were 0.484 and 0.518 respectively, which showed that the predictive power of the model was sufficient.

Figure 3. PLS result of SEM model for specialist patients

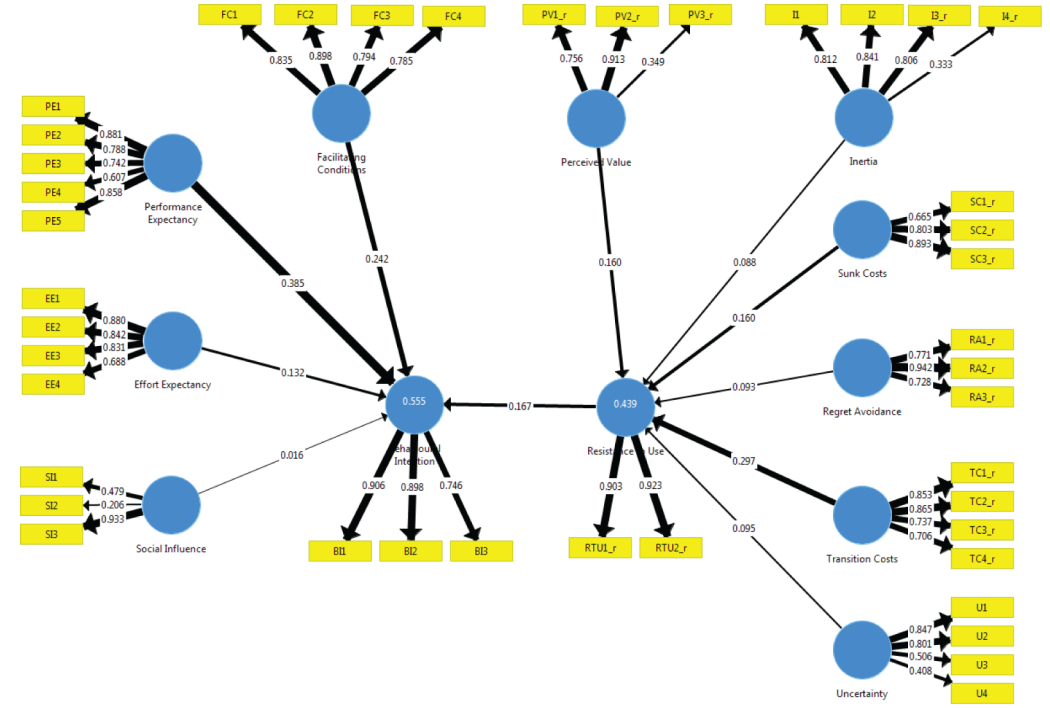


Figure 4. PLS result of SEM model for non-specialist patients

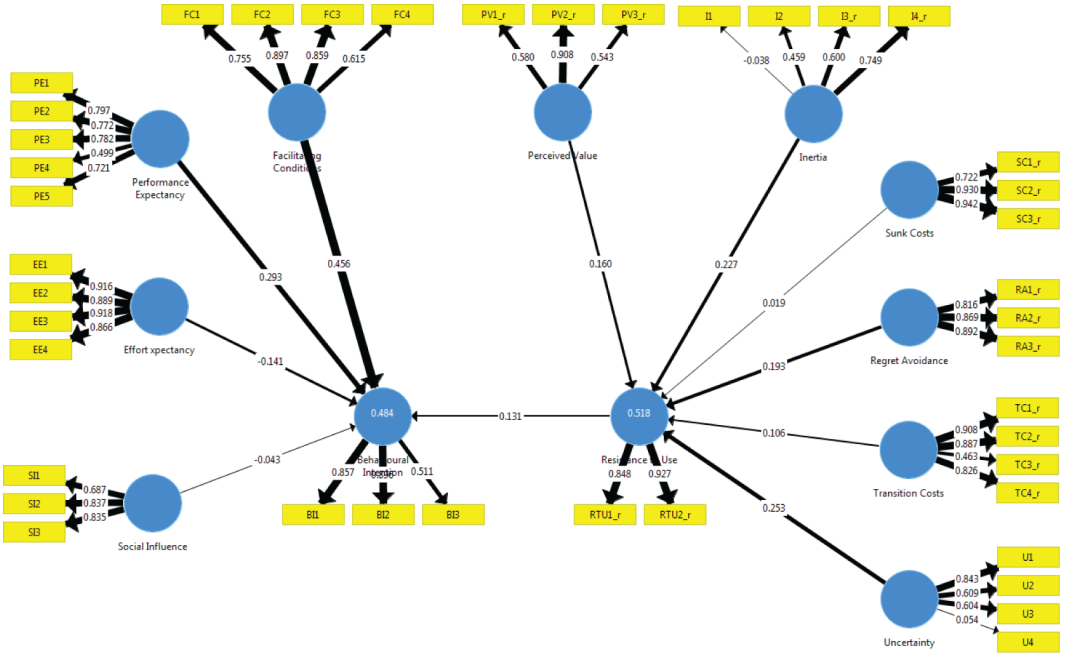


Table 6. Hypothesis test results by necessity of visiting specialist out patient clinic

Hypotheses	SOP Estimate	NSOP Estimate	Estimate Coefficient Different (SOP vs. NSOP)
H1: Resistance to use → Behavioral intention	0.167***	0.131	0.036
H2: Performance expectancy → Behavioral intention	0.385***	0.293***	0.093
H3: Effort expectancy → Behavioral intention	0.132	-0.141	0.273*
H4: Facilitating conditions → Behavioral intention	0.242**	0.456***	0.214
H5: Social influence → Behavioral intention	0.016	-0.043	0.059
H6: Sunk costs → Resistance to use	0.160	0.019**	0.141
H7: Regret avoidance → Resistance to use	0.093	0.193**	0.100
H8: Inertia → Resistance to use	0.088	0.227**	0.139
H9: Perceived value → Resistance to use	0.160	0.019**	0.141
H10: Transition costs → Resistance to use	0.297***	0.106	0.191*
H11: Uncertainty → Resistance to use	0.095	0.253***	0.158

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

4.3. Discussion

According to the results generated by using SmartPLS, it was found that there was a variance for the factors affecting behavioural intentions and resistance of patients toward eHRSS between three groups, which were the group of all patients, patients seeing specialists regularly and patients who did not require to see a specialist regularly.

4.3.1. Behavioural Intention

According to the results, performance expectancy is the common and the most significant variable affecting behavioural intention in three models including data from all patients, SOP data, and NSOP data, which are with coefficients of 0.323, 0.385 and 0.293 respectively. Comparing five exogenous variables, PE1 is the item contributing much to performance expectancy. It represents that many patients may believe that eHRSS helps to reduce administrative errors by facilitating public-private partnership if more than one department is involved in the process of giving healthcare services, and this is the biggest advantage of eHRSS that motivates patients to register in eHRSS. PE4 gives the lowest contribution to performance expectancy, which represents that there are not many patients agree that the lack of comprehensive electronic system unifying patients' data leads to medical errors. In other words, they may think that the usage of eHRSS may not be able to reduce medical mistakes.

The second most important and common variable in three models (all patients, SOP, NSOP) is facilitating conditions, which are with a coefficient of 0.312, 0.242 and 0.456 respectively. FC2 is the item with the most contribution to facilitating conditions compared with other three items. According to the literature, facilitating conditions about the degree to which the user believes that the infrastructure of the new technology or an organisation is able to support he or her to use the system. Facilitating conditions in the SEM model is in turn interpreted as patients' confidence in the system developed by Hospital Authority and it has become an important factor affecting the variable of facilitating conditions. Patients tend to have a higher level of intention to join eHRSS when they are confident in work performance of Hospital Authority.

Furthermore, only the NSOP model shows there is a relationship between social influence and behavioural intention. A possible reason is that the main channels of the patients, who are not required to see a specialist regularly, accessing medical information are mass media, social media, family and friends except for healthcare providers. However, according to the responses collecting by face-to-face interview, some respondents mentioned that advertising of eHRSS in the mass media was not able to clearly express detail information about the registration method of eHRSS. Although they knew that there were various channels for registration, patients may not realise the procedure of activating their health record afterwards. Hence, it is necessary for the government to explore another way promoting eHRSS.

In addition, it is shown that resistance to use is negatively correlated to behavioural intention in the model of all patients in SOP model, but not in the NSOP model. This may imply that resistance to use significantly influence behavioural intentions of patients visiting specialists regularly rather than the normal patients. Therefore, factors affecting resistance to use in SOP model are highlighted.

4.3.2. Resistance to Use

For all patients, regret avoidance is found to be the most significant factor influencing resistance to use of patients toward eHRSS, which is with a standardised beta coefficient of 0.413. Among RA1, RA2, and RA3, RA2 is the item ranked the highest contributor to regret avoidance. The patients tend to give a sharing consent for a one-year renewable period instead of an indefinite term in eHRSS. It implies that most of the patients, regardless their necessity of seeing a specialist regularly, may consider the possible bad outcomes brought by registering in eHRSS. They may prevent from taking risks to avoid regret. Besides, despite the lower coefficients, transition costs are also the factor affecting resistance to use. TC1 is the highest item contributing to transition costs, which represents that patients resist registering in eHRSS because they do not want to spend much time on registration of eHRSS. The time cost is one of the most critical concerns for them. Transition costs are also the factor significantly influence specialist patients' resistance to use as shown in SOP model of Figure 3.

On the other hand, in the NSOP model, the factors having a strong relationship with resistance to using are different from those in SOP model. It was found that sunk costs and regret avoidance put a significant effect on resistance to using of the normal patients, in which the major contribution comes from SC3 and RA3 respectively. For sunk costs, the results support that one of the biggest concerns of normal patients is potential losses brought by switching to use eHRSS from an old system. Also, sunk costs could be an investment of time and effort. Comparing to potential gains from joining eHRSS, normal patients may think that it is not worth to put lots of time or effort on registration of eHRSS or giving consent to healthcare providers. For regret avoidance and item RA3, it is highlighted that patients may concern about types of information shared in the eHRSS. In the present stage, filtering information uploaded to the online platform according to patients' requests is not available. Despite the scope of shareable data is clearly listed out in the eHRSS publication and website, patients are too passive to control what information shared among public and private healthcare providers and hence patients' resistance to use eHRSS is increased.

In addition, estimate coefficient different for two groups indicates that they have a considerable difference regarding effort expectancy and transition costs. Specialist patients may have a higher level of effort expectancy than normal patients because they may use healthcare services provided Hospital Authority more frequently and thus have more confidence in the system developed by it. Besides, transition costs are considered as an important factor influencing resistance to using of specialist patients but not that of normal patients. It may imply that there is another possible reason causing normal patients resist to join in the programme of eHRSS. For instance, during a face-to-face interview, some patients mention that it was not necessary for them to use eHRSS as they were not required to use healthcare services frequently, or they always go to the same hospital or clinics which already had their complete health record.

5. CONCLUSION

This paper contributes to identifying significant factors influencing behavioural intention and resistance of patients toward eHRSS. The data collected by questionnaire were then divided into two groups, specialist patients, and normal patients and were analysed by using PLS-SEM. It was found that the common factors affecting behavioural intention of patients in two groups are performance expectancy and effort expectancy. However, for resistance to use, two groups give different results. Transition costs were identified to be the only factor significantly affect resistance to use of specialist patients, while sunk costs and regret avoidance were positively correlated with resistance to use of normal patients. Based on the PLS results, recommendations were provided for promoting eHRSS to the public in order to extend the usage of the system in Hong Kong. It is suggested to put more resources on holding promotion booths in public hospitals and clinics in every region to let more patients know about eHRSS. Also, it is possible for promotion to be conducted in the government offices such as Immigration Branch Offices and Licensing Office. Last but not least, the registration process is recommended to be simplified as much as possible.

5.1. Implications of the Study

To extend the usage of eHRSS in Hong Kong, it is essential to explore an effective way of promotion to the public. Before that, the first thing should be done is to identify the factors that influence the attitudes of patients toward eHRSS. Therefore, suggestions for promotion of eHRSS will be given based on the results of this study.

First of all, it was found that a major proportion of patients who have registered in eHRSS are required to see specialists regularly. It implies that strengthening the propaganda of eHRSS to normal patients is necessary. Despite there are already advertisings on mass media and publications, they may not know the ways and procedures of registration of eHRSS in details. It is suggested to set promotion booths in all public hospitals and clinics in a period to attract and encourage patients to understand more about eHRSS. As a result, the patients may weigh higher potential gains with potential losses from brought by joining eHRSS due to a deeper understanding of the system. At the same time, the booths should have a sufficient number of staff to help patients do the registration right away. Promotion could also be conducted in the government offices such as Immigration Branch Offices and Licensing Offices.

Second, resistance to the use of specialist patients may be reduced by simplifying the registration process of eHRSS. The current process is to fill in and submit a form online or send it to eHR Registration Office by fax, post or drop-in box located in the office. Although applying online is convenient, the advantage may be limited to the youngsters only. For those who are not familiar with computer technology, especially for the elderly, they may not be able to take advantage of it. It is recommended to encourage specialist patients doing registration when they are waiting for seeing a specialist and the form is given together with a medical appointment token. It is because normally patients have to wait for a period before seeing a specialist and hence making good use of time is suggested. After the form has been filled in, the patient could simply submit e-copy of the form onto the online system

5.2. Limitations and Future Research

The limitation of this study is to the number of patients who have registered in eHRSS. Since the implementation of eHRSS is still in the early stage, most of the patients have not joined in the programme yet. For future work, it could be improved by increasing the number of the patients registering in the system to take a more macro view in order to obtain a more accurate result.

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APPENDIX A: QUESTIONNAIRE WITH HYPOTHESES

Hypothesis 1: Resistance to use has a negative effect on behavioural intention

BI1	If I know that my healthcare providers need to use eHRSS, I will join this programme without other considerations.
BI2	If the government requires all hospitals and clinics replace traditional paper documentation with online information sharing platform, I will join this programme without other considerations.
BI3	In the short term, I would recommend my family and friends to join eHRSS.
RTU1	My personal information had been stolen/disclosed before, so I do not want to register in eHRSS.
RTU2	I do not want to register in eHRSS due to the prior bad experience on using new technology proposed by the government (e.g. GovHK, TouchMed).

Hypothesis 2: Performance expectancy has a positive effect on behavioural intention

PE1	eHRSS helps to reduce errors associated with paper records.
PE2	eHRSS helps healthcare providers to obtain comprehensive health record of patients.
PE3	eHRSS helps me to obtain helpful and accurate information for care.
PE4	I think that medical errors are caused by the lack of a comprehensive electronic system to unify patient data.
PE5	If more than one department (e.g. X-ray, physiotherapy, orthopaedics) are involved in my treatment and assessment, I think that eHRSS can help to reduce administrative errors by facilitating public-private partnership.

Hypothesis 3: Effort expectancy has a positive effect on behavioural intention

EE1	Registration of eHRSS is simple and convenient.
EE2	I can choose the most suitable one among different registration channels for eHRSS (e.g. in person, eHR Registration Centres, online registration at eHRSS website, postal mail, fax, a drop-in box of eHR Registration Office).
EE3	I completed the registration of eHRSS with the assistance of the staff or sufficient guidance.
EE4	It is easy for me to find eHRSS healthcare providers.

Hypothesis 4: Facilitating conditions have a positive effect on behavioural intention

FC1	I believe that it is necessary for the doctors or other healthcare providers to obtain my health record through eHRSS when I am using healthcare services.
FC2	I believe Hospital Authority is able to provide a comprehensive electronic system for patients and healthcare providers.
FC3	I am confident with system security of eHRSS proposed by Hospital Authority, which is able to safeguard the personal information of the patients.
FC4	I believe I can obtain my health record in eHRSS when it is necessary.

Hypothesis 5: Social influence has a positive effect on behavioural intention

SI1	Mass media (e.g. TV, magazines, posters) provides information that makes me more willing to join eHRSS.
SI2	Social media (e.g. Facebook, Instagram, Twitter) provides information that makes me more willing to join eHRSS.
SI3	If my family or friends have joined eHRSS, I will be more willing to join it.

Hypothesis 6: Sunk costs have a positive effect on resistance to use

SC1	Whenever I am sick, I go to the same hospital/clinic. They have my detail health record, so I do not need a public-private electronic health record system.
SC2	I think that paper records are better than electronic records.
SC3	I think that potential losses from switching to use a new electronic record system (eHRSS) are larger than potential gains.

Hypothesis 7: Regret avoidance has a positive effect on resistance to use

RA1	I think that there is a certain level of risks regarding to the use of eHRSS, such as data breach.
RA2	I would choose to give a sharing consent for a one-year renewable period instead of an indefinite term in eHRSS.
RA3	Filtering information uploaded to the system according to patient's request is currently not available in eHRSS, and that is why I don't want to register in eHRSS.

Hypothesis 8: Inertia has a positive effect on resistance to use

I1	I am happy to adapt and learn how to use new technology.
I2	If eHRSS has a new function in the future, I will want to know more about it.
I3	I used to rely on the hospital/clinic original independent medical record system. I do not want to adapt to a new electronic medical record system.
I4	I think that I am not able to control and select information I would like to upload to eHRSS.

Hypothesis 9: Perceived value has a negative effect on resistance to use

PV1	eHRSS is not very useful to me.
PV2	eHRSS is very complicated to me. I do not understand its operation.
PV3	I will be asked about my health record and history of drug allergy whenever I go to see a doctor, which is very annoying.

Hypothesis 10: Transition costs have a positive effect on resistance to use

TC1	I do not want to spend extra time on registration in eHRSS.
TC2	I think that registration of a new system is a waste of time.
TC3	I have to get more information about eHRSS before I do the registration.
TC4	I do not want to spend time on giving consent to particular healthcare providers to read my health record.

Hypothesis 11: Uncertainty has a positive effect on resistance to use

U1	When my health record in eHRSS is being assessed, I will be notified by SMS. It makes me feel relieved.
U2	I have confidence in eHRSS under the supervision of the Hospital Authority.
U3	I am not worried that my health record will be viewed by people who are not healthcare providers.
U4	It is reasonable that a fee is charged when I want to obtain my health record kept in eHRSS.

APPENDIX B: BOOTSTRAPPING RESULTS OF THE MULTI-GROUP ANALYSIS

Table 7. Bootstrapping results of the multi-group analysis

	Path Coefficients Original (NSOP)	Path Coefficients Original (SOP)	Path Coefficients Mean (NSOP)	Path Coefficients Mean (SOP)	STDEV (NSOP)	STDEV (SOP)	t-Values (NSOP)	t-Values (SOP	p-Values (NSOP)	p-Values (SOP)
H1	-0.141	0.132	-0.100	0.137	0.138	0.089	1.019	1.486	0.309	0.138
H2	0.456	0.242	0.440	0.248	0.087	0.106	5.252	2.277	0.000	0.023
H3	0.227	0.088	0.236	0.096	0.078	0.083	2.919	1.064	0.004	0.288
H4	0.160	0.160	0.149	0.159	0.097	0.097	1.648	1.645	0.100	0.101
H5	0.293	0.385	0.304	0.378	0.089	0.098	3.302	3.917	0.001	0.000
H6	0.193	0.093	0.178	0.099	0.088	0.081	2.183	1.139	0.029	0.255
H7	0.131	0.167	0.130	0.165	0.086	0.063	1.525	2.655	0.128	0.008
H8	-0.043	0.016	-0.043	-0.002	0.078	0.098	0.550	0.159	0.582	0.874
H9	0.019	0.160	0.028	0.160	0.106	0.098	0.183	1.626	0.855	0.105
H10	0.106	0.297	0.117	0.288	0.075	0.113	1.414	2.638	0.158	0.009
H11	0.253	0.095	0.261	0.112	0.076	0.073	3.324	1.293	0.001	0.197

APPENDIX C: A PARAMETRIC TEST OF THE MULTI-GROUP ANALYSIS

Table 8. A parametric test of the multi-group analysis

	Path Coefficients-diff (NSOP)	t-Value (SOP) vs (NSOP)	p-Value (SOP) vs (NSOP)
H1	0.273	1.658	0.099
H2	0.214	1.566	0.119
H3	0.139	1.224	0.222
H4	0.000	0.001	0.999
H5	0.093	0.702	0.483
H6	0.100	0.838	0.403
H7	0.036	0.342	0.733
H8	0.059	0.470	0.639
H9	0.141	0.976	0.330
H10	0.191	1.429	0.154
H11	0.158	1.503	0.134

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