

Applying the Planned Behavior Theory to Assess Health Behavior Intention and Performance of Chronic Illness Outpatients

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Abstract

Background: The purpose of this study was to evaluate the Theory of Planned Behavior (TPB) to predict intention and self-reported health behavior of people with chronic illness. Cross-sectional exploratory correlated design was conducted.

Methods and Results: Using convenient sampling to recruit four hundred outpatients with various chronic illness diagnoses completed the structured questionnaire. Subjects were near equal numbers of women and men, about half with less than a high school education. Variables based on the TPB were assessed through questionnaire items developed from a qualitative research to form scales measuring attitudes, subjective norms, perceived behavioral control and intention to perform health behavior. Health behavior performance was measured by using a health behavior scale. Pearson correlation was used to test the association between the scales for the 4 variables proposed in the TPB and the performance of health behavior. The α level was set at .05 to determine the statistical significance of results.

Results: Forced entry multiple regression showed that the theory of planned behavior explained 47% of the variance in health behavioral intentions and 6% of the variance in performing health behavior. Previous research has been conducted with sample of various chronic illness diagnoses to test the theory of planned behavior. The present study, then, extends previous work to expand our viewpoints toward the health behavioral intention for people with chronic illness. Additionally, the utility of TPB to explain the performance of health behavior is controversial.

Conclusion: The findings from this study implied that the constructs of TPB were psychosocial variables which focused on explaining the intention for health behavior. The present study also revealed that a limited utility of TPB as a theoretical framework for explaining the health behavioral performance of Taiwanese chronically population. We suggested that nurses provided educational programs for people with chronic illness and thereby improved their competency of health behavioral performance.

Key words: health behavioral intentions, health behavioral performance, people with chronic illness, and Theory of Planned Behavior.

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收稿日期，98年9月14日

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I. Introduction

In recent years, a growing number of reports have emerged examining the role of health behaviors as an adjunct supportive therapy for patients with chronic illness (Andrykowski, Beacham, Schmidt, & Harper, 2006; Bull, Bakin, Reeves, & Riley, 2006; Kagee & van der Merwe, 2006; Leventhal, Musumeci, & Leventhal, 2006; Mola et al., 2007; Walker, Weeks, McAvoy, & Demetriou, 2005). The empirical studies have provided promising evidence that health behavior may be an important modality to improve patients' health status and quality of life (Gretebeck et al., 2007; Hwu & Lin, 2005).

"Health for All" is appropriate for healthy people as well as chronically ill population. Since health behavior is positively associated with overall quality of life, strategies aiming at increasing health behavior motivation/adherence in patients with chronic illness are warranted (Kagee & van der Merwe, 2006). Despite well-documented potential benefits of health behaviors, some people with chronic illness still performed little activity to maintain or promote their health (Hwu, 2005). Finding strategies to promote health behaviors for people with chronic illness is an important and urgent issue.

As an initial step toward this goal, it is important to understand the underlying determinants of health behavior in patients with chronic illness. Identification of salient determinant allows the researcher to target these constructs in subsequent interventions, thus maximizing the likelihood of behavior change. The use of a sound theoretical approach can increase the understanding of health behaviors of people with chronic illness and apply to structuring both health-related programs and decision-making support programs for them. Although there are a number of social cognitive frameworks available, one theory that has received considerable support in the health behavior domain is the Theory of Planned Behavior (TPB) (Armitage & Conner, 2001). The TPB is a model of human behavior that describes key informational and motivational constructs of behavior prediction. Hence, when the present study was initiated, the Theory of Planned Behavior was chosen to be the theoretical framework for exploring its predicting power in health behavioral intention and health behavioral performance in people with chronic illness.

According to the theory (Figure 1), health behavior is influenced by three independent constructs: attitude, which is a person's favorable or unfavorable evaluation of the behavior; Subjective norm, which is a person's reflection of the perceived social pressure from important others to perform the behavior; Perceived behavioral control, which is a person's perception of the ease or difficulty of performing the behavior based on past experiences, resources, opportunities, and

barriers. Perceived behavioral control has an indirect effect on behavior through intention and also may have a direct effect on behavior when a person's perceived behavioral control is an accurate reflection of actual behavioral control (Ajzen, 1991).

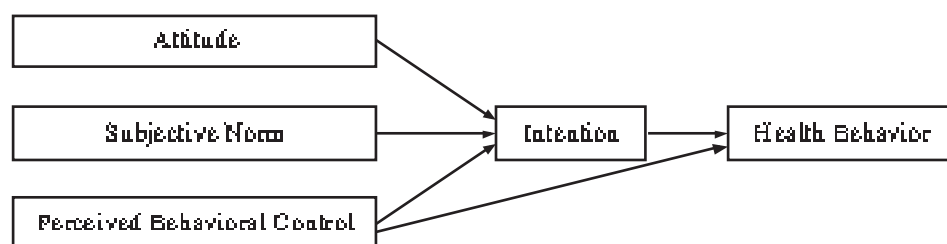


Figure 1 The theory of planned behavior

Taken together, these constructs lead to the formation of health behavioral intentions. Therefore, intention is postulated to be the immediate determinant of health behavior. Behavioral intention represents the amount of willingness to try, and the amount of effort an individual is planning to exert in order to perform a behavior.

TPB has been proven to be a useful framework for understanding initiation and maintenance of a variety of behaviors related to physical health such as consumption of a healthy diet and participation in an exercise regimen (Armitage & Conner, 2001; Grøetebeck et al., 2007; Guina, Vincent, Jørgensen, Dugas, & Semper, 2007; Rives, Sheeran, & Armitage, 2006).

In recent years, a number of TPB-based health behavior determinant studies were conducted in a wide range of chronically population (Andrykowski et al., 2006; Bull, et al., 2006; Kagee & van der Merwe, 2006; Leventhal et al., 2006; Mola et al., 2007; Walker et al., 2005). Overall, these studies supported the efficacy of the TPB in the prediction and understanding of health behavior in people with chronic illness. These reports also suggested that the relative importance of the various TPB constructs might vary depending on the chronically ill groups. However, the target sample of the research in the past focused on one specific kind of diagnosis of chronic illness. No study to date has examined the salient determinants of health behavior in patients diagnosed with different kinds of chronic illnesses. Additionally, patients with different kinds of chronic illnesses have shared some categories of health behaviors (Hwu & Lin, 2005).

The specific objective of this study was to examine if attitude, subjective norm, and perceived behavioral control were significantly correlated with health behavioral intentions and performing health behaviors. Furthermore, the independent predictors of health behavioral intentions and performing health behaviors were determined.

II. Methods

Study Design and Subjects

This study used a cross-sectional exploratory correlated design. Initial individual interviews using open-ended questions were conducted with 36 people with different chronic illness diagnoses to obtain information necessary to develop the questionnaire (Hwu & Yu, 2006). The subjects were recruited from one teaching regional hospital in the middle Taiwan. Those who participated in initial interviews were not asked to complete the questionnaires.

The criteria for sampling were that individuals were over 20 years old, were able to speak Mandarin, were diagnosed with a chronic illness for at least one year and were drawn from the outpatient departments of one hospital in Taiwan. The convenience sample consisted of 209 males and 191 females with chronic illness with a mean age of 60.7 ± 14.4 years. The major diagnoses for the sample were diabetes mellitus (17.1 %), hypertension (15.8 %), renal diseases (15.1 %), cancer (14.9 %), heart disease (14.2 %), respiratory diseases (9.6 %), stroke diseases (7.9 %), and liver diseases (5.5 %). Most participants (86.5 %) also had other chronic illness or complications. The mean duration of the major diagnosis was 7.5 (range: 1-51) years.

Procedure

Permission to conduct the research was obtained from the ethical committee of hospital. The health teaching room in the hospital was chosen as the place to interview recruited participants.

When the patient and the clinic nurse entered the room, the researcher introduced herself, explained the study purpose and procedures, and obtained informed consent. Patients were told to feel free to discontinue at any time without any consequence. Information about the health behaviors was gathered through interviews lasting approximately 30 minutes. To avoid any embarrassment for participants with literacy problems, the researcher read each questionnaire item aloud and invited opinions. Participant anonymity was maintained in the coding process.

Study Instruments

Theory of Planned Behavior (TPB) constructs were assessed by using items developed from a qualitative research exploring health behavior determinants for people with chronic illness (Hwu & Yu, 2006).

Attitude is the overall personal evaluations of performing the behavior by the individual. It was assessed by 13 items rated on a 5-point scale that tapped outcome belief 7 items and outcome evaluation 6 items. The verbal descriptors were from extremely agree (point 5) to extremely disagree (point 1). Negative statements were scored reversely. Outcome belief implied the motivation to perform health behavior, the sample items were "Performing health behavior makes me more healthier", and "Performing health behavior keeps me fit".

Outcome evaluation meant the possible consequences for performing health behaviors, for example, beneficial-harmful and enjoyable-unenjoyable. Separate scores were calculated for outcome belief and outcome evaluation by using the mean of the items that constituted each aspect of attitude. Attitudes toward performing health behaviors were defined as the summated score of the 13 behavioral beliefs and outcome evaluation. The Cronbach α coefficient was .82 and was considered acceptable for the attitude scale.

Subjective norm is the perceived social pressure on the individual to perform or not to perform health behavior. It was assessed by referent's belief 4 items and motivation for compliance 4 items. The former implied the opinions toward health behavior among families, friends and professionals; and the latter measured the degree of compliance facing the referent's groups.

A 5-point Likert scale was applied with response options ranging from strongly disagree to strongly agree. The examples for items were "My families think I should take actions to promote health", and "I would like to follow my families' suggestions to perform health behavior". The subjective norms variable was defined as the summated score of the product of each referent's belief and motivation to comply. The scale's alpha reliability for the study herein was .81 which was considered acceptable.

Perceived behavioral control was assessed by 4 items to identify the degree that make health behavior adoption easy or difficult. During the initial interviews, subjects identified factors or situations that made it easy or difficult to perform health behaviors. Similar responses were grouped together resulting in four items to measure control beliefs for perceived behavioral control over performing health behaviors. These included perceived self-competence in performing health behaviors, access to information and available resources. These items were rated on 5-point scales (strongly disagree to strongly agree). The items were as follows, "For me, taking actions to promote health is very easy", and "I am confident to take actions for promoting health". Perceived

behavioral control over performing health behaviors was defined as the summated score of control beliefs. Cronbach alpha for the scale was high at .90.

To measure intention toward health behavior, subjects responded to 4 items rated on a 5-point scale. For example, "I intend to take actions for promoting my health status", and "I expect I will take actions to promote my health status". The mean of the 4 items was used as the measure of intention. The internal consistency was .89.

Health Behavior Scale (HBS) was defined as the behaviors which people with chronic illness currently regularly perform to maintain or promote their health, measured by the Health Behavior Scale. Subjects were asked to indicate how often (always to never) they usually performed for 26 health behavior items. Each item was measured on a 5-point summated rating scale, from 5 (always) to 1 (never). Higher scores represented more positive health behaviors.

The examples for the items were "Take prescribed medications", "Eat food to increase Qi or vitality", "Retain the heart of thanks", "Be willing to help others", "Perform religious rituals to achieve inner peace", and "Do one's best and listen to Heaven". The internal consistency (α) was .89 for the Health Behavior Scale.

A preliminary draft of the questionnaire was reviewed by 3 professionals and pilot tested with 30 people with chronic illness to check understanding of items. Based on the pilot test, minor changes were made in format and wording.

Statistical Analysis

Data were analyzed using SPSS version 17.1 software. Participant demographic/medical characteristics and the TPB constructs were analyzed by using descriptive statistics. A series of Pearson product correlations were used to examine the bivariate associations between TPB constructs, health behavioral intentions, and performing health behaviors. To determine the independent predictors of health behavioral intentions and performing health behaviors, we used forced entry multiple regression analyses within theoretically based blocks of variables as previously described. All analyses were conducted on controlling the potential confounders such as demographic/medical characteristics (i.e. age, gender, diagnosis of chronic illness).

To examine the relative importance of each variable in explaining variance in the dependent variable, the square of the standardized β for each variable was obtained, and the ratio of each standardized β was examined. A level of $p < .05$ was considered significant for statistical tests.

III. Results

The mean of the 26 health behavior items was 3.51 ($SD = 0.86$). The possible score for health behavioral performance ranging from 1 to 5 suggested that subjects currently often performed health behaviors. It might be that people with chronic illnesses using the health services for a specific health problem periodically were more aware of the importance of performing health behaviors.

Since age, gender and diagnosis of chronic illnesses were not significantly correlated with health behavioral intention and performance of health behavior in this study, their confounding influences were excluded.

The matrix of correlation of study variables for people with chronic illness was presented in Table 1. It was the simplest way of identifying multicollinearity. Correlation coefficients were low to moderate and were arranged in the expected direction. Health behavioral performance was significantly related to the 4 variables proposed in the TPB, in the order of decreasing, attitude toward performing health behaviors, perceived behavioral control, subjective norm, and intention. Intention was strongly correlated with TPB constructs. Intention toward performing health behaviors was highly correlated with the perceived behavioral control ($r = .57, p < .01$), subjective norm, and attitude.

Table 1 Correlation among Study Variables

Variables	1	2	3	4	5	<i>M</i>	<i>SD</i>
1. Health Behavior	—					3.51	0.86
2. Intention	0.11 ⁺	—				3.96	0.73
3. Attitude	0.22 ⁺	.44 ^{**}	—			3.28	0.47
4. Subjective Norm	.16 ⁺	.52 ^{**}	.30 ^{**}	—		3.41	0.72
5. Perceived Behavioral Control	.18 ⁺	.57 ^{**}	.74 ^{**}	.26 ^{**}	—	3.99	0.67

* $p < .05$; ** $p < .01$

Hierarchical regression analysis was used to examine the predictive validity of the TPB. The dependent variables were behavioral intention and health behavior. Attitude was the significant predictor of health behavioral intentions (on step 1 of the hierarchical regression) accounted for 20% of the variance. Attitude remained predictive of behavioral intentions after subjective norm variable was entered into the equation. Inclusion subjective norm added 16% of explained variance.

Perceived behavioral control variable was entered on step 3, and it increased explained variance to a total of 47% (Table 2).

Table 2 Hierarchical Regression of Performing Health Behavioral Intention (N = 400)

Item	β	t	R	R^2	F
Step 1.					
Attitude	.44	10.32*	.44	.20	26.24
Step 2.					
Attitude	.32	7.85*			
Subjective Norm	.43	10.61*	.60	.36	123.03
Step 3.					
Attitude	-.05	-.94			
Subjective Norm	.40	11.02*			
Perceived Behavioral Control	.50	9.59*	.69	.47	129.72

* $p < .05$

For the hierarchical regression predicting performing health behaviors, there were no constructs of TPB significantly contributed to variance explained, except attitude and subjective norm. Although attitude and subjective norm were the predictors of performing health behaviors, they only accounted for 5% and 1% of the variance respectively (Table 3).

Table 3 Hierarchical Regression of Performing Health Behavior

Item	β	t	R	R^2	F
Step 1					
Intention	.11	2.40*	.11	.01	5.77
Step 2					
Intention	.02	.40			
Attitude	.21	4.01*	.22	.05	11.17
Step 3					
Intention	-.03	-.57			
Attitude	.20	3.86*	.24	.06	8.91
Subjective Norm	.11	2.06*			
Step 4					
Intention	-.05	-.84			
Attitude	.16	2.34*			
Subjective Norm	.12	2.14*	.24	.06	6.82
Perceived Behavioral Control	.06	.76			

IV. Discussion

This study examined the application of the TPB to understand the determinants of health behavioral intentions and health behavioral performance in a chronically ill population. Specific objectives were to determine the independent predictors of intention and health behavior.

Consistent with the underlying postulates of the TPB, intention, attitude, subjective norm, and perceived behavioral control were individually correlated with health behavior in bivariate analyses. In the same way, attitude, subjective norm, perceived behavioral control and intention were significantly correlated.

Attitude, subjective norm, and perceived behavioral control explained almost half of the variance in the intention to perform health behaviors. As for performing health behavior, only attitude and subjective norm reached significance, explained 6% variance.

In a recent meta-analysis, it was concluded that the three TPB variables used here accounted for about 39% of the variance in behavioral intentions across a variety of health behaviors (Armitage & Conner, 2001). The present analysis showed that approximately 47% of the variance in health behavioral intentions was explained by TPB variables. Attitude was the strongest predictor of behavioral intentions (beta = 0.44). According to the analytic review, the majority of studies using the TPB in health behavior research have reported that attitude have had the most pervasive influence on intentions (Armitage & Conner, 2001). This is a potentially important finding, suggesting that the enhancement of attitude may be a way to increase intentions to perform health behaviors.

Although the matrix of correlation showed that study variables were significantly related, most of the subjects were often not always to perform health behaviors (Mean = 3.51). It was the fact that attitude accounted a little amount of the variance (5%) in performing health behaviors. Because attitude was likely to be influenced by one's cognitive understanding of the importance of health behavior on one's health, it was important to consider factors that could affect attitude formation (Rhodes, Flotnikoff, & Courneya, 2008). Attitudes formed through direct personal experience were better predictors of behavior (McGilligan, McCleashan, & Adamson, 2009). The strength of chronically ill people's attitudes to health behavior might therefore be influenced by the fact that they did not see the direct effect of health behavior immediately, if at all. The interval between someone performing health behaviors and developing a healthier condition made it unlikely that the two events would be naturally associated. This time lag made it difficult to reinforce by demonstration.

that a given action resulted in a predicted consequence. Teaching or sharing through demonstration and experiential learning might result in higher information retention rates for adult learners (Rhodes, Flotnikoff, & Courneya, 2008). A more practical approach to teaching and discussing the importance and value of health behaviors would facilitate to shape chronically ill person's attitude and achieve long-term behavioral change.

People with chronic illness were easily influenced by others to change their health behaviors as evidenced by the significant impact of subjective norm on intention and health behavior. Social ecological theories of health behavior reinforced the importance of social support for health behavior (Bull et al., 2006). This viewpoint was consistent with the subjective norm of TPB. Multi level supports were statistically significantly associated with behavioral intentions and performance of health behaviors (Chen & Wang, 2007). Family members would influence the decision to engage in health behavior for people with chronic illness. Professional encouragement and support during and beyond the clinical encounter should be sought to reinforce the influence of subjective norm. Nurses might be particularly well placed to address such issues and take strategies to improve health behaviors for chronically ill population.

The results of this research showed that perceived behavioral control influenced intentions to engage in health behavior, not for health behavior itself. In other words, the present results suggested that perceived behavioral control was a very important variable in predicting intention to perform health behavior but not a significant one in directly explaining the health behavioral performance.

Consequently, although it might be very important to understand the ease and difficulty of performing health behavior in the intention to perform health behavior, the actual health behavioral performance appears to be out of its influence. This was in line with what had been observed for years in the field of adherence to health behavior: Providing factual information on the ease and difficulty of performing health behavior was not enough to insure the actual health behavioral performance (Blanchard et al., 2009).

What is intriguing, though, is the fact that the constructs of TPB did not strongly explain the health behavioral performance. The total variance of attitude and subjective norm accounting for performing health behaviors was just 6%, whereas the perceived behavioral control and intention had no influence on health behavioral performance. It might be that people with chronic illness were in more advanced stages of decision making to perform health behaviors than general population (Armitage & Conner, 2001). The possible explanation was that chronic illness impacted on decision

making through other pathways. Chronic illness has been linked to a higher risk of depression and chronic morbidity status as well as the emotional state of chronically population was found to predict their internal control towards chronic illness (Kivimäki, Hurre, & Aro, 2007; Niü, Ng, Kua, Ho, & Tan, 2007). Therefore, it is possible that biological and physiological changes were associated with chronic illness influencing the emotional response which in turn impacted on people's decision making about health behavioral performance. In this regard, the somatic marker hypothesis in which a defect in emotion and feeling played an important role in decision making to perform health behaviors should be tested in future studies.

The finding that the behavioral intention was not a significant predictor for health behavioral performance is interesting. Generally speaking, the variable of intention in TPB was used to predict the behavioral performance in the coming days whereas the Health Behavior Scale used in this study was measured the current performance of health behaviors. It was hypothesized that current health behavior was related to health behavior measured in the near future. In this study, a low Pearson correlation ($r = .11$) was found between intention and health behavior. It meant that those with higher intention in fact had lower practice scores. Therefore, intention alone was not enough to impact upon health behavioral performance. A combination of strategic interventions is necessary to increase the performing health behaviors.

According to the theoretic framework of TPB, the intention was a predictor of a given behavior (Ajzen, 1991). In other words, the focus of TPB was a given behavior and using the constructs of TPB to predict its intention and performance. Health behaviors, however, in this study were conceptualized as comprising three dimensions (physical, psychosocial and spiritual). There were multiple items in each dimension. Although the Health Behavior Scale has been validated its psychometric integrity (Hwu & Lin, 2004), its multi behavior construct might not be appropriate for the TPB.

Guinn et al. (2007) investigated the present behavior as a predictor of activity intent and found it attenuated theory construct influence on intention. It might be due to cognitions such as attitude, subjective norm, and perceived behavioral control having less utility in motivating individuals who were already engaging in health behaviors. This was one of the possible reasons for interpreting the low Pearson correlation between intention and health behavior.

While prior research with the TPB has demonstrated that intentions were typically fairly strong proximal indicators of subsequent health behavior (Armitage & Conner, 2001), future research

should prospectively examine the health behavior performance in the following months, not focus on the current performance. Additionally, external variables such as personality traits and attitudes toward people might influence behavior indirectly through attitude and subjective norm (Gretebeck et al., 2007). These variables could be added or controlled in the future study to test their variance in explaining the health behavioral performance (Rhodes & Blanchard, 2006).

Our sample were recruited people with different chronic illness diagnoses, the results provided broader view to understand the utility of the TPB in predicting both behavioral intentions and health behavioral performance.

Conclusion

This study has explored the utility of the TPB in predicting and explaining the intentions and performance of health behaviors for people with chronic illness. The results gave a discourse on the TPB as a framework for understanding the determinants of health behavior in people with chronic illness.

The findings indicated that chronically ill population who expressed more favorable attitudes toward health behavior, more normative support for health behavior, and less difficulty in their ability to perform health behavior reported stronger intentions to perform health behavior.

This study has demonstrated the significant of using the TPB as a basis for explaining health behavioral intention. Additionally, the present study also revealed that a limited utility of TPB as a theoretical framework for explaining the health behavioral performance of Taiwanese chronically population. We suggested that nurses provide educational programs for people with chronic illness and thereby improve their competency of health behavioral performance. Since the constructs of TPB couldn't fully explain the cognitive decision making process in health behavioral performance for chronically ill population in Taiwanese context, the addition of the other constructs (i.e., self-efficacy) will further enhance the predictive validity of the model.

Limitations

It is clear, however, that the study has some limitations. While the current cross-sectional design does not allow causation to be determined, nonetheless such exploratory work is a necessary stage in identifying factors appropriate for study in follow-up longitudinal studies. Self-report measures could be a limitation as they may result in over-estimation of intention and behavior.

Despite these limitations, this study has achieved its aims and has provided a framework to

build block for both theoretical developments and practical interventions. Additionally, the information provided by the present study should be useful to those interested in the health behavioral intentions of people with chronic illness.

V. Acknowledgments

This research was funded by an National Science Council grant (NSC-94-2314-B-166-001). We wanted to thank the people with chronic illness who agreed to participate in the study. We also wanted to thank the anonymous reviewers for their helpful comments on an earlier draft of this paper.

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運用計畫行為理論詮釋門診慢性病患者健康行為的意向與執行成效

林豐裕 胡月娟

摘要

背景，本研究目的在運用計畫行為理論，以預測慢性病患者健康行為的意向與執行。

病患和方法，採結構式問卷訪談 400 位不同慢性病診斷的門診患者。受訪對象男女比例相當，近一半的受訪對象，其教育程度在高中以下。計畫行為理論中的變項，態度、主觀規範、感知的行為控制，與健康行為意向，皆以問卷題項建構的量表做評估。健康行為的執行，則以健康行為量表做測量。以皮爾森相關檢定計畫行為理論的四個變項，與健康行為執行間的相關性。 α 值定在 .05，以做為研究結果統計分析是否是顯著的判定標準。

結果，複迴歸分析顯示計劃行為理論可解釋健康行為意向 47% 的變異量，健康行為的執行則只有 6% 的變異量。研究結果顯示運用計劃行為理論，有助於詮釋慢性病患者採取健康行為的意向，但在健康行為的執行上則無法充分呈現慢性患者的認知決策過程。因此需添增其他變數，以提升此模式的預測效度。護理人員應盡心力以改善慢性病患者的態度與提供支持，以促進其健康行為的執行。

關鍵詞：健康行為的意向、健康行為的執行成效、慢性病患者、計畫行為理論。

