

Chronic Patients' Prescription Refill Intentions

Ching - Yi Lee, I-Hsiung Tseng, and Feng-Chuan Pan

Abstract—Environment today is featured with aging population, increasing prevalence of chronic disease and complex of medical treatment. Safe use of pharmaceuticals relied very much on the efforts made by both the health-related organizations and as well as the government agencies. As far as the specialization concern in providing health services to the patients, the government actively issued and implemented the divisions of medical treatment and pharmaceutical to improve the quality of care and to reduce medication errors and ensure public health. Pharmaceutical sub-sector policy has been implemented for 13 years. This study attempts to explore the factors that affect the patients' behavior intention of refilling a prescription from a NHIB pharmacy. Samples were those patients refilling their prescriptions with the case NHIB pharmacies. A self-administered questionnaire was used to collect respondents' information while the patients or family members visit the pharmacy for the refilling. 1,200 questionnaires were dispatched in 37 pharmacies that randomly selected from Pingtung City, Dongkang, Chaozhou, Hengchun areas. 732 responses were gained with 604 valid samples for further analyses. Results of data analyses indicated that respondents' attitude, subjective norm, perceived behavior control and behavior intentions toward refilling behavior varied from some demographic variables to another. This research also suggested adding actual behavior, either by a self-report or observed, into the research.

Keywords—Separation of dispensing and prescribing, prescriptions refill slip, NHIB contracted pharmacy, drug safety, theory of planned behavior.

I. INTRODUCTION

AS the theory of Morbidity Expansion predicted [1], chronic diseases prevailed fast in Taiwan since this country became an aging society of which 7 percent of its population aged 65 or more since 1993. Diseases of this kind need to be well controlled to assure a quality life of these chronic patients. Since the almost all chronic diseases were covered by the National Health Insurance (NHI) Policy, the government in Taiwan had established a policy of Separation of dispensing and prescribing in 1997. The chronic patients are entitled and free of charge to refill their prescriptions from any contracted pharmacy since then.

Separation of dispensing and prescribing had been generally agreed by both of academicians and practitioners benefiting the public and the healthcare industries in many aspects. 1. Fostering the professional development to secure the quality of drug use and safety of medication. 2. Effective managing and saving cost by reducing repetitive drug use and waste. 3. Securing the patients' right to know about the content of

prescription through the independent pharmacists' dispensing and explaining. 4. Saving the patients' resources of time and money with easier access and low financial burden. 5. As a result, alleviating the financial burden of the NHI. This system apparently can benefit the patients with easy accessibility and very low opportunity costs. Even more important is the pharmacist of the contracted pharmacy may spare more time in delivering wider and detailed information regarding the medicine. The only drawback of the system is it may reduce the income level of the hospitals in which the patients were used to refill the prescription. Despite of the benefits the patients may receive and the large amount of cost the NHI may save, the proportion of prescription refilling from the contracted pharmacies remain low. This has aloft the reimbursement payment, of which a major detrimental factors to the financial health of the NHI. This research, based on the theory of planned behavior, attempted to explore the factors associated with the chronic patients' behavior intention, namely the attitude, subjective norms, and perceived behavior control. The research expected to shed some lights on how the patients' antecedents of behavior intention may vary across personal factors. Therefore, the research question focus in verify whether the personal factors matter in the respondents' attitude toward, subjective norms of, perceived behavior control over, and behavior intention of the refilling chronic prescription from a contracted pharmacy..

A. Theory of Planned Behavior

The theory of planned behavior (TPB) [2] was developed by extending the theory of reasoned action (TRA) [3] [4] [5] [6]. TRA had been used to successfully explain and predict behavioral issues in a wide variety of contexts [6]. However, it exposed to several critiques by ignoring the respondent's self-confidence over the controlling of own behavior. The TPB added perceived behavioral control (PBC) refers to the level of control over or perceived easiness or perceived difficulty of the intended behavior [7] [8] [9] [10] [11]. Attitude (AT) refers to a positive or negative judgment an individual holds toward a particular behavior [12], and could be either measured directly or by a product of "behavior belief" and "outcome expectation" [13]. Subjective norm. Subjective norm (SN) refers to the external pressures of the social or the reference group an individual perceived when performing a particular behavior [13][14]. Perceived behavior control. Perceived behavior control (PBC) refers to the extent of facilitators and barriers an individual perceived when performing a particular behavior, of which similar to the concept of self-efficacy (SE) [15] [16]. This means how confident of an individual will successfully execute a planned behavior. Some argued that SE and PBC are look similar but in fact are distinctive. PBC could be measured directly [17] or as a product of "control belief" and "control facilitator".

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Behavior intention. Behavior intention (BI) is the most effective predictor of a behavior [2]. It is described as the levels of readiness of an individual to perform a particular behavior. According to the TPB, the behavior intention is affected either by single antecedent of AT, SN, and PBC respectively or jointly [18]. This could be expressed as $B \sim BI = AT (W1) + SN (W2) + PBC (W3)$, where W1, W2 and W3 are weights of AT, SN, and PBC respectively. Meta-analyses studies had generally proofed that the TPB having greater power in explaining and predicting focus behaviors than the TRA [19] [20] [21]. Therefore, TPB became one of the major theories in explaining and predicting behavior intention and behaviors in varied health behavior contexts with great success. In this study, we can also conclude that the behavior intention of refilling the prescription from a contracted pharmacy will be affected by the chronic patients' attitude, subjective norm, and perceived behavior control [19] [20]. We then hypothesize this argument as follow.

H1: The magnitudes of the chronic patients' attitude toward, subjective norm of, and perceived control over the behavior of refilling the chronic prescription from a contracted pharmacy have strong associations with the intention of refilling. Extrinsic variables to TPB. Although the TPB included external influences such as varied reference groups in the model as part of independent effects to predict the behavior intention, there are some other factors external to the model and that may pre-determine the extent of these independent effects [2]. In other words, the AT, SN, and PBC could be view as the intrinsic factors that could be affected by different extrinsic factors. Some common extrinsic factors are found in past studies, such as demographic factors, personality, job characteristics, and contextual factors [22] [23] [24] [25]. We may conclude that the extent of the chronic patients' intention and the causing factors may be affected by these personal and contextual factors. Therefore, a hypothesis is then proposed as follow.

H2: The chronic patients' attitude toward, subjective norm of, perceived control over, and intention of refilling the chronic prescription from a contracted pharmacy will vary along with the individual's personal factors.

II. MATERIALS AND METHODS

A. Samples and Measuring Instrument

Instrument adopted to measure the constructs in this research basically follows the measurement suggested by [17]. The questionnaire had suggested several ways to measure the individual constructs contained in the theory of planned behavior. A set of 15 items portion in this questionnaire was suggested to measure the major constructs directly. This research follows this suggestion. In addition, personal factors involved generally refer to previous studies [22] [23] [24] [25]. Reliability of major constructs are all acceptable at 0.90 for behavior intention, 0.71 for attitude, 0.84 for subjective norms, and 0.60 for perceived behavior control [26].

B. Sample Distribution

Samples are taken from four population areas of the Pingtung County. The research randomly select 37 of 158 contracted pharmacies within the authority of the county. The questionnaires were dispatched to the chronic patients or their refilling agent (mostly are their significant others) through the pharmacy. 604 valid questionnaires are collected out of 1200 invitations. Sample distributions are generally illustrated as follow and detailed in table I. Female gender (52.3%); aged 41-70 (70.7%), Married (78.5%), unemployed (33.3%), and at least high-school education (58.3%) signaled the general profile of the respondents in this research. In addition, more than half of the respondents suffered with two or more chronic diseases.

TABLE I
SAMPLE DISTRIBUTION

Variable	Category	n	%
Gender	Male	288	47.7
	Female	316	52.3
Age	40-	53	8.8
	41-50	119	19.7
	51-60	172	28.5
	61-70	136	22.5
	71+	124	20.5
Marriage	Single w/family	72	11.9
	Single w/o family	58	9.6
	Married, w/family	474	78.5
Origin	Ming Nan	395	65.4
	Hakka	147	24.3
	China mainland	37	6.1
	Primitive tribes	25	4.1
Occupation	Government service	97	16.1
	Blue collar	43	7.1
	Commerce	52	8.6
	Primary industries	61	10.1
	Services	80	13.2
	Self-employed	70	11.6
	Unemployed	201	33.3
Education	Elementary or less	156	25.8
	Junior high	96	15.9
	Senior high	150	24.8
	College	120	19.9
Residence	Bachelor +	82	13.6
	Pingtung	257	42.5
	Don Gang	128	21.2
	Chau Chou	165	27.3
	Herrnstein	54	8.9
N of diseases	1	292	48.3
	2	205	33.9
	3 +	107	17.7

n=604

III. RESULTS

A. Variance analyses

Gender : An independent t-test shows that attitude (AT), subjective norms (SN), perceived behavior control (PBC), and behavior intention (BI) are not significant different in terms of gender. This is similar to the studies of Rhodes and colleagues [27] [24], yet inconsistent to [22] [25]. The inconsistency may stem from the contextual differences [16].

TABLE II
GENDER IN MAJOR CONSTRUCTS

Variables	Group	n	Mean	S.D.	t
AT	M	288	5.96	0.84	-0.18
	F	316	5.97	0.83	
SN	M	288	5.81	0.91	-0.65
	F	316	5.86	0.86	
PBC	M	288	5.95	0.87	0.26
	F	316	5.93	0.88	
BI	M	288	6.10	0.89	-0.38
	F	316	6.13	0.83	

* $p < .05$; ** $p < .01$; *** $p < .001$; $n=604$

Age. Some significant differences are found for AT, SN, PBC, and BI in terms of age from a one-way ANOVA. We have conducted a further post hoc analysis by LSD, and find that the group of aged 71 and over is more positive in AT, SN than the groups of aged under 40 and aged 61-70. This particular age group retains stronger PBC than the rest age groups. In the perception of behavioral intention, the oldest age group is stronger than the ages under 40 only, shown as the table III. Study results are consistent to previous studies [23] [25] [27].

TABLE III
AGE IN MAJOR CONSTRUCTS

Var.	Group	n	Mean	S.D.	F	LSD
AT	1	53	5.73	0.93	3.01*	5>1,2,4
	2	119	5.89	0.87		
	3	172	5.99	0.84		
	4	136	5.94	0.84		
	5	124	6.15	0.70		
SN	1	53	5.60	1.04	2.01*	5>1,3
	2	119	5.87	0.87		
	3	172	5.76	0.94		
	4	136	5.86	0.85		
	5	124	5.97	0.77		
PBC	1	53	5.62	0.92	4.10**	5>1,2,3
	2	119	5.85	0.95		
	3	172	5.88	0.88		
	4	136	6.04	0.85		
	5	124	6.12	0.76		
BI	1	53	5.77	1.18	3.25*	5>1
	2	119	6.07	0.85		
	3	172	6.13	0.87		
	4	136	6.15	0.79		
	5	124	6.26	0.70		

1. 40-, 2. 41-50, 3. 51-60, 4. 61-70, 5. 71+, ; $n=604$ * $p < .05$; ** $p < .01$; *** $p < .001$

Marital status, occupation, educational levels. No significant differences are found for AT, SN, PBC, and BI in terms of marital status, occupation, and educational levels from a one-way ANOVA. This indicates that no matter whether the individuals are married or not, or what occupation they are serving, or what levels of education they have completed, their AT, SN, PBC, and BI may not be affected by these particular factors. Residence district. The locations of contracted pharmacies may varied from one district to another, of which in turn provide varied levels of accessibility for the chronic patients. As shown in the table IV, patients that reside in Hengchun hold stronger AT, SN and BI than the rest of the regions. Compare to the other districts, the township of Hengchun is less populated with very few hospitals in the region.

This may restrict the patients to refill the chronic prescription from a hospital. Noteworthy is the chronic patients may still perceive the contracted pharmacy an alternative choice. Noteworthy is the Pingtung is the most populated with higher levels of economic activities, yet it chronic patients in this area is the least in AT, SN, and BI in refilling from a contracted pharmacy. Access to hospital is easy for the Pingtung residents, some wastes may still there in an affluent area.

TABLE IV
RESIDENCE DISTRICT ON MAJOR CONSTRUCTS

Var.	Group	n	Mean	S.D.	F	LSD
AT	1	257	5.88	0.79	2.72*	4>1
	2	128	6.01	0.80		
	3	165	6.00	0.91		
	4	54	6.21	0.80		
SN	1	257	5.62	0.84	13.19**	4>3,2,1
	2	128	5.95	0.82		
	3	165	5.91	0.97		
	4	54	6.36	0.67		
PBC	1	257	5.90	0.86	1.33	-
	2	128	6.05	0.78		
	3	165	5.87	0.94		
	4	54	6.01	0.93		
BI	1	257	6.04	0.84	2.50	4>1,3
	2	128	6.15	0.80		
	3	165	6.12	0.95		
	4	54	6.38	0.67		

1. Pingtung, 2. Dongkang, 3. Chaozhou, 4. Hengchun

* $p < .05$; ** $p < .01$; *** $p < .001$; $n=604$

In general, differences are found in some demographic factors only for the AT, SN, PBC, and the BI of refilling the prescription from a contracted pharmacy. Accessibility of a hospital would be the most important factor that determine the chronic patients' intention (and highly possible the actual behavior as well) of this particular behavior. Since refilling this particular prescription represents a wide variety of benefits to the patients, the healthcare industries, and the NHI, and the current research shows that there are ample room remain for improvement. The government and the public health agencies should allocate significant portion of resource in further educating the chronic patients.

B. Correlations

A Pearson's correlation is then conducted to examine the relationships between variables of AT, SN, PBC, and BI. The test result shows that significant relationships are found among these variables. The values of the associations of respective variables with BI in descending order are SN (0.82), AT (0.78), and PBC (0.71), as shown in table V. These values of correlation coefficient are much higher than the previous studies as reported by the meta-analytic study of Armitage & Conner (2001) [20], in which the average value were 0.34 for SN, 0.49 for AT, and 0.43 for PBC respectively.

TABLE V
CORRELATION COEFFICIENTS OF AT, SN, PBC, & BI

	1	2	3	4
1.BI	1.00			
2.AT	0.78**	1.00		
3.SN	0.82**	0.76**	1.00	
4.PBC	0.71**	0.72**	0.63**	1.00

* $p < .05$; ** $p < .01$; *** $p < .001$; $n=604$

IV. CONCLUSION

The policy of Separation of Dispensing and Prescribing can benefit the patients as well as the society at large in many ways. Despite that the multiple benefits may be shared by the patients as well as the insurance subscribers (i. e. the nationals of the country in legal terms); the chronic patients in metropolitan area where the medical resources are easily accessible are still reluctant to refill their chronic medicines from a qualified pharmacy. Consistent to previous studies in health behaviors, the current research confirmed the impacts of the attitude, subjective norm, and perceived behavioral control on the behavior intention in the refilling behavior are visible. Unlike other studies that arguing the PBC is the most significant determinants of an intention, this study reveals that the subjective norm could be the major determinant of all predictors. This study also proofed that some constructs of theory of planned behavior varied across several demographic factors. In addition, this research has also confirmed the applicability of this theory in explaining the refilling behavior of chronic patients. Restricted by the financial and time resources, this research was unable to examine the association between an intention and the behavior. Advanced studies to observe the actual behavior after the respondents' expression is important for public health scholars to perform. Some argued that perceived behavior control and self-efficacy are similar to each other and could be used interchangeable in an academic study. This would be also worthy for scholars to verify. To the last of this paper and shall not be the ultimate of the similar research, identifying and adding new variables to enhance the patients' attitudes, the effectiveness of social norm on the patients, and the patients' confidence on both of their confidence toward themselves and trust on the pharmacists' capability would promise a fruitful return for the academicians and practitioner.

ACKNOWLEDGMENT

CYL wish to present her gratefulness to the colleagues in the Pingtung Public Health Bureau for their spiritual support and useful advices in this research.

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