The Prevalence of Type D Personality and Correlations between Medication Self-Efficacy and Self-Care Behavior in Patients with Hypertension

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Abstract

Background: Type D personality is a combination of 2 traits which are negative affectivity and social inhibition. In health care situation, type D patients are more likely to have non-medication adherence, pessimistic about their ability to cope with illness and believe that it will be long-lasting which lead them to present worse health outcomes. This study aimed to examine the prevalence of type D personality and associations among medication self-efficacy and self-care behaviors in patients with hypertension. **Methods:** This is a descriptive cross-sectional study. Patients with hypertension ($n = 383$) who attended a primary care unit were recruited. Volunteering participants completed the Type D-Scale (DS14) questionnaire for the evaluation of the prevalence of type D personality. To evaluate medication self-efficacy and self-care behavior, Self-efficacy for Appropriate Medication Use Scale Thai version and Self-care behaviors scale for patients with hypertension were employed. Descriptive statistics, t-test, and Pearson's correlations were used in data analysis. **Results:** Fifty-six participants (14.6%) were classified with type D personality (26 males and 30 females). A positive relationship between medication self-efficacy and self-care behavior was found ($r = 0.294$, $p < 0.01$). In contrast, type D personality had a negative association with medication self-efficacy and self-care behavior ($r = -0.251$, $r = -0.138$, $p < 0.01$). **Conclusion:** Compare to the previous studies, the present study illustrated quite lower prevalence of type D personality. Type D personality is a psychological health risk factor which negatively affects health both directly and indirectly, especially self-efficacy and self-care behavior. Even just one of the two type D personality traits can lead to a similar detrimental result. Positive relationship between medication self-efficacy and self-care behavior can be applied to develop health promotion programs for patient with hypertension.

Background

Hypertension (Society, 2017) or high blood pressure is a major Non-Communicable Diseases (NCDs) because of its high prevalence and complications. Individual risk factors such as drinking alcohol, smoking, sedentary lifestyle, unhealthy eating and stress are the key factors of the disease. Absent medical treatment or the realization of the problem by patients with hypertension, the disease can lead to fatal consequences. In 2016, a quarter of Thai population suffered from this disease, and the number of patients appears to be increasing. Hypertension is called a dangerous killer due to its nature, with patients having high blood pressure without any apparent sign. Thus, it is hard for patients to realize that they are in danger. If patients do not appropriately get diagnosis and treatment, it can lead to indirect health risks such as stroke, paraplegia, paralysis and heart attack. Hypertension usually co-develops with others NCDs such as diabetes, coronary heart disease (CHD), renal failure, and obesity which are the leading causes of death in Thailand. Since 2003, the World Health Organization has reported that hypertension is a significant risk factor of cardiovascular heart disease. Hypertension treatment is still inadequately managed, while its benefit has been shown to decrease disease risk and can enhance health (WHO, 2017).

In the past, medication treatment and illness focused on genetics, drugs, nutrition, and exercise, but now psychological factors are also considered to be necessary. Nowadays, hypertension treatment guidelines not only depend on medication but also emphasize a healthier lifestyle. Consistent, positive self-care behavior is a method that has been shown to decrease risk as well as the use of anti-hypertensive drugs. Furthermore, research finds that negative emotions like depression, anxiety, anger or fatigue have associations with cardiovascular heart disease and cause poor prognosis (Frasure-Smith, Lespérance, & Talajic, 1995).

In the last 40 years, health-related personality has been categorized as either type A or type B Personalities. Type A includes traits such as competitiveness, rigidity, time urgency and hostility; while type B persons are more relaxed, patient, and easy going. These health-related personalities were found by two cardiologists studying coronary heart disease (CHD) patients. They found that type As have higher CHD and hypertension risk than type Bs (Rosenman, Friedman, Straus, & et al., 1964). In 1996, Johan Denollet, a Belgium psychologist, labeled type D personality, which stands for distress (Denollet, 2000). Type D is a combination of 2 traits which are Negative Affectivity (NA) and Social Inhibition (SI). Negative affectivity is defined as the tendency to experience negative emotional states and situations, comprising dysphoria, feelings of tension, and worry. Social inhibition involves the tendency to inhibit the expression of emotions, thoughts and behaviors when it comes to social interaction, due to anticipation of adverse reactions or rejection from others. Patients with type D personality are more likely to have non-medication adherence and low quality of life. Besides, worse health outcomes are a significant obstacle to adequate medical treatments. Similarly, type D personality has an association with metabolic syndrome (diabetes, hypertension, dyslipidemia) which is a risk of CHD (Petrowski, Wendt, Wichmann, & Siepmann, 2017), as well as with a higher risk of poor prognosis (Mols, Thong, de Poll-Franse, Roukema, & Denollet, 2012). The

prevalence of type D personality in hypertensive patients was double that in non-hypertensive patients (Denollet, 2005; Wu, Song, & Moser, 2015).

At present, there have been many research and survey studies about the prevalence of type D personality in many countries and populations, with findings as follows: From a sample of 3813 subjects among the general population, CHD patients and hypertensive patients in Belgium and the Netherlands, the prevalence of type D personality was found to be 21%, 28%, and 53%, respectively (Denollet, 2005). Metabolic syndrome was found to be more prevalent in persons with a type D personality than in a group without type D personality (13% vs. 6%). Investigating health factors, 18.1% of type D personality patients suffered from hypertension and 12.4% had lipid abnormalities (Mommersteeg, Kupper, & Denollet, 2010). Also, one study reported a 36% prevalence of type D personality in 135 Belgian police officers and nurses (De Fruyt & Denollet, 2002). On investigating prevalence of type D personality in a community with 3689 subjects in Augsburg, Germany, the prevalence of type D personality was found to be 23.4% in males and 26.9% in female (Hausteiner et al., 2010). In Denmark, a research review to test the validity of Type D Personality Scale-16 found a prevalence of 25% in the general population. A research survey of 1012 healthy subjects in England and Ireland found a prevalence of type D personality of 38.5%. This prevalence was the highest in any previous research in other European countries. Study of type D personality has also been done in Korea and China in Asia. Focusing on developing the Type D Personality Scale-14 Korean Version (DS14), a study showed the prevalence of type D personality at about 27% in 3 groups: healthy controls, CHD patients, and hypertensive patients without heart disease (Lim et al., 2011). In a China population, type D personality was 18.2% of the sample of 532 patients with type 2 diabetes mellitus. (Shao, Yin, & Wan, 2017).

Self-efficacy is a personal trait that is changeable and can be learned, so its level varies among people (Hathaitip Tuntatead, 2014). Self-efficacy is considered useful as a medication self-care behavior reinforcer. A personal belief that one can motivate oneself and can prolong control of desired behavior has a significant role in how a person changes from a risky to healthy behavior. Medication self-efficacy plays a vital role in an association between type D personality, medication adherence, and self-care behavior (Wu et al., 2015). These are necessary for individual's capacity to produce desired effects. Chronic disease patients who have high self-efficacy exhibited more self-care behavior and medication adherence.

Every patient has their own personality type. When it comes to a health-care situation, type D patients may be seen as hopeless patients; for example, they struggle with negative thoughts, pessimistic about their ability to cope with illness and believe that it will be long-lasting. Due to limited past studies of type D personality in Thailand, this study utilized the Siriraj primary care unit to study the prevalence of type D personality in patients with hypertension. Further, the correlations of self-efficacy, self-care behavior and type D personality are observed in this study.

Methods

The present study hypothesized that 1) the level of medication self-efficacy and self-care behavior in type D personality patients and non-type D group are different, and 2) there are relationships between medication self-efficacy, self-care behavior and type D personality.

Participants

Participants in this study were patients with hypertension in Siriraj primary care unit, Bangkok, Thailand. The sample size was 383 subjects which selected by the inclusion criteria: 1) Physicians must have diagnosed subjects for at least six months before participation in the study, 2) Subjects have taken anti-hypertension medicine and have been in a program for hypertension treatment for at least six months, 3) Subjects have to take anti-hypertension medicine and mediate self-care behaviors by themselves, 4) Subjects must obtain self-care literacy from physicians or health care officers. Data collecting period was between November 1st, 2018 and December 31st, 2018.

Measuring Instruments

The instrument used in this research composed of 4 parts;

Part 1: The socio-demographic data of 5 questions include gender, age, status, illness duration, and other health conditions.

Part 2: The Type D-Scale (DS14), Thai Edition used to measure type D personality. The DS14 consisted of 14 questions; 7 questions of Negative Affectivity (NA), and 7 questions of Social Inhibition (SI). This instrument is a 5-point rating scale questionnaire from 0-4 points. Possible scores ranged from 0-28 with a cut-off point of 10 in both sub-scales. Subjects with a score of 10 or above were considered to have type D personality. For reliability, the Cronbach's alpha score is 0.768.

Part 3: The Self-efficacy for Appropriate Medication Use Scale Thai Version was used to measure medication self-efficacy. This instrument is a 3-point rating scale questionnaire, consisting of 13 questions. Total score can range from 13-39. The value of Cronbach's alpha was 0.90 (Polsook, Aungsueroch, Thanasilp, & R Duffy, 2014).

Part 4: The self-care behavior in patients with hypertension measurement was used to measure self-care behavior. There are 20 questions about nine aspects of self-care activities that restricted the level of sodium in food taken, restriction of fatty foods, weight control, physical activities, relaxation techniques, adequacy of sleep, medication adherence, avoiding alcoholic drinks, keeping away from smoking. The Cronbach's alpha coefficient of reliability of this instrument is 0.77 (Peamnoon, 2009).

Statistical analysis

Statistical analysis: descriptive statistics were used to characterize demographic data in all participants; frequency, percentage, mean, and standard deviation. To test the hypotheses, t-test, and Pearson's correlation coefficient were used to analysis. A p-value of less than 0.05 was considered statistically significant. All statistical analyses were performed using the Statistic Package for the Social Science (SPSS) program.

Results

Demographic data

Participants were 383 patients with hypertension, 127 males and 256 females, age 39 to 99 years old (mean age 67.55, SD. ± 8.47). Nearly half of the sample (44.9%) was in the range of 60–69 years old. Most participants were married (80.2%) followed by single (16.7%) and divorced (3.1%). One hundred and thirty-eight (36%) of participants have been in a treatment for hypertension for less than five years, whereas two hundred and forty-five (64.0%) have suffered from hypertension for more than five years. Besides, one hundred and thirty-five (35.2%) have no co-morbid diseases (diabetes, dyslipidemia, coronary disease, stroke, cancer, etc.) (Table 1)

Table 1
Demographic data of the participants

	All Participants		Type D Personality	
Demographic data	N = 383	Percent (%)	N = 56	Percent (%)
Gender	127	33.2	26	46.4
Male	256	66.8	30	53.6
Female				
Age*	59	15.4	6	10.7
Younger than 60	172	44.9	29	51.8
60–69	115	30	15	26.8
70–79	36	9.4	5	8.9
80–89	1	0.3	1	1.8
90 and older				
Marital Status	64	16.7	9	16.1
Single	307	80.2	43	76.8
Married	12	3.1	4	7.1
Divorced				
Illness Duration	138	36.0	21	37.5
6 months – 4 Years	116	30.3	19	33.9
5 Years – 10 Years	129	33.7	16	28.6
More than 10 Years				
Other Health Conditions	135	35.2	16	28.6
None	248	46.8	40	76.8
Yes				
* M = 68.01, S.D. = 8.81, Range = 51 – 99				

The Prevalence of Type D Personality

According to a standard cut-point at 10 in both components, results from the type D personality Scale-14 Thai Version are shown in Table 1. Fifty-six participants or 14.6% were categorized as having type D personality while the rest were in the non-type D personality group.

The data were classified with two sub-scales showed one hundred and one participants (26.4%) were in negative affectivity group, whereas one hundred and eighteen participants (30.8%) were categorized having only the social inhibition trait.

There were 56 participants (14.6%) who were found having type D personality; among these, there were 26 males and 30 females. Ages ranged from 51 to 99 years old (M = 68.01, S.D. = 8.81) with slightly more than a half the sample from 60 to 69 years old (51.8%). As to marital status, most of this group were married (76.8%), followed by single (16.1%) and divorced (7.1%), respectively. More than half of the patients with type D personality suffered from hypertension for over than five years with 33.9% having taken hypertensive medicine for more than ten years, while 28.6% had taken medicine for five to ten years. One-third of patients had only high blood pressure while the majority also had other health conditions. Most common comorbid Non-Communicable Diseases (NCDs) were diabetes, dyslipidemia and coronary disease.

Testing t-test between Type D and Non-Type D Personality Groups in Medication Self-Efficacy and Self-Care Behavior

Table 2
The mean score comparisons of medication self-efficacy and self-care behavior between personality groups

Medication Self-Efficacy	N	Mean	S.D.	t	p-value
Type D	56	35.77	± 3.23	2.22	.029
Non-Type D	327	36.76	± 2.36		
Negative Affectivity	101	36.01	± 2.93	2.54	.012
Non-Negative Affectivity	282	36.84	± 2.34		
Social Inhibition	118	36.10	± 2.74	2.72	.007
Non-Social Inhibition	265	36.86	± 2.39		
Self-Care Behavior	N	Mean	S.D.	t	p-value
Type D	56	48.69	± 4.75	4.71	< .001
Non-Type D	327	51.56	± 4.11		
Negative Affectivity	101	49.21	± 5.03	4.76	< .000
Non-Negative Affectivity	282	51.84	± 3.82		
Social Inhibition	118	49.56	± 4.56	3.73	< .000
Non-Social Inhibition	265	51.69	± 4.11		

There was a significant difference in medication self-efficacy between the type D personality and non-type D personality group ($p < .05$). Also, when comparing the mean scores of these two domains, there was a significant difference in medication self-efficacy between negative affectivity and non-negative affectivity groups ($p < .05$). Also, a significant difference in medication self-efficacy between social inhibition and non-social inhibition groups was observed ($p < .05$).

There was a significant difference in self-care behavior between type D personality and non-type D personality group ($p < .001$). Also, when comparing the mean scores of these two domains, there was a significant difference in self-care behavior between those with negative affectivity and non-negative affectivity groups ($p < .001$). As well, a significant difference in self-care behavior between social inhibition group and non-social inhibition group was observed ($p < .001$).

Table 3
Correlations among Medication Self-Efficacy, Self-Care Behavior and Type D Personality

	Medication Self-Efficacy	Self-Care Behavior	Type D Personality	Negative Affectivity	Social Inhibition
Medication Self-Efficacy	1	.294**	-.233**	-.251**	-.138**
Self-Care Behavior		1	-.300**	-.300**	-.199**
Type-D Personality			1	.828**	.837**
Negative Affectivity				1	.386**
Social Inhibition					1
** correlation is significant at the 0.01 level (2-tailed)					

There was a positive correlation between medication self-efficacy and self-care behavior ($r = 0.294$, $p < 0.01$). There was also a negative correlation between medication self-efficacy and type D personality ($r = -0.233$, $p < 0.01$). When these two domains were analyzed, only a negative correlation between medication self-efficacy and negative affectivity was presented ($r = -0.251$, $p < 0.01$), as well as a negative correlation between medication self-efficacy and social inhibition ($r = -0.138$, $p < 0.01$).

There was a negative correlation between self-care behavior and type D personality ($r = -0.300$, $p < 0.01$). When these two domains were analyzed, there was a negative significant correlation between self-care behavior and negative affectivity ($r = -0.300$, $p < 0.01$), as

well as a negative correlation between self-care behavior and social inhibition ($r = -0.199, p < 0.01$).

These results demonstrate that both medication self-efficacy and self-care behavior have negative relationships to type D personality and its domains.

Discussion

Following the objectives of this study, our discussions of the results are summarized into 4 points as follows:

The prevalence of Type D Personality

The prevalence of type D personality in the present study was 14.6% which is less than the previous studies (Denollet, 2005; Hausteiner et al., 2010; Molloy et al., 2012; Petrowski et al., 2017; Shao et al., 2017; Wu et al., 2015). The closest prevalence of other studies was found from a survey conducted in the Netherlands, with 18.1% of type D personality from 215 patients with hypertension (Mommersteeg et al., 2010).

The proportion of elder participants was 84.60% which may explain this lower prevalence. Stressors in retired people differ from younger people or those of working age, so this might be one factor responsible for decreased work and socioeconomic stress. In Thai society, most elders tend to spend their leisure time with their religious beliefs which has positive effects on mental health.

The prevalence found is close to that found in other Asian countries such as the 18.2% prevalence of type D personality in type 2 diabetic patients in Chinese patients (Shao et al., 2017). Likewise, the prevalence of type D personality in Korean healthy, CHD, and hypertension groups was 27% (Lim et al., 2011). In contrast, when compared to the findings in western countries, more significant differentiations was found: a study in Belgium and the Netherlands among healthy group, CHD patients and hypertensive patients, 21%, 28%, and 54% were categorized as type D, respectively (Denollet, 2005).

The differentiation of factors like ethnicity and culture between Europeans and Asians could have some relevance to this diversity of prevalence (Goziev, 2016). In western groups, individualism and freedom might be more important than in an eastern group. In addition, in asking about agreement with some statements in the DS-14 questionnaire like *"I often feel unhappy; I take a gloomy view of thing; I am often in a bad mood; I find it hard to start a conversation; and, I am a closed kind of person,"* could have been perceived as more negative in Asian cultures. Especially, being friendly and having close relationships in Thai context could have affected SI scores.

As to gender-specific effects, this study found that the prevalence of type D personality in males (20.47%) was more than in females (11.71%). This finding differs from the data collected in Augsburg, Germany, which found fewer males than females, 23.4% to 26.9%, respectively (Hausteiner et al., 2010). In the same way, another study with a German sample reported that the prevalence in males was 31.3%, and for females, the prevalence was 38.4% (Grande et al., 2004). Results show that most participants were elders (the average age was 67.55 years old). The 8th stage (65 years +) from Erik Erikson's Stages of Psychosocial Development, Integrity vs. Despair, could be relevant (Erickson, 1998). Erikson explained that stressors of people in this stage usually come from health conditions from degeneration and stress. Seniors feel stress in adapting to retirement and developing life satisfaction, happiness, and peacefulness. In Thai context, males usually play a dominant role in the family, and by transferring to a dependent stage experience stress from a feeling of emasculation, especially when not prepared.

The difference of Self-Efficacy between Type D and Non-Type D Personality Groups

This study found that mean scores of medication self-efficacy in these two groups (36.76:35.77) were significantly different. This difference implies that those of type D personality often have negative feelings toward both situations and themselves. This affect and inhibition can lead to unhappiness, anxiety, and frustration. The social inhibition describes how persons often feel uncomfortable when it comes to social situations because they are afraid of being rejected, that is relevant since persons with type D personality tend to show lower self-efficacy score (Petrowski et al., 2017).

The difference of Self-Care Behavior between Type D and Non-Type D Personality Groups

This study found that mean scores of self-care behavior between type D personality group and others are significantly different. The difference implies that people with type D personality have hypertension self-care behaviors different from others, as seen in previous studies. Several studies present evidence that those of type D personality tend to have lower medication adherence when compared to others (Li et al., 2016; Wu et al., 2015). In conclusion, they described that people with type D personality are less interested in taking care of their health and have a hard time following healthy self-care behavior patterns as suggested.

This lack of attention is consistent with the results of this study which found that the type D personality group had lower self-efficacy score than those without type D personality. Bandura's theory of self-efficacy describes self-efficacy as people's belief that they can handle any situation and control it until attaining their goal (Bandura, 1978). In this context, when type D patients have low self-efficacy, they also tend to have low health behavior control.

Correlations among Medication Self-Efficacy, Self-Care Behavior and Type D Personality

A positive relationship between medication self-efficacy and self-care behavior was found. This finding is maybe a result of one's belief in medication self-control which can lead to one's decisions weather act. One study in African-American subjects reported an association between high self-efficacy and good hypertension self-care behavior in 5 behaviors out of 6 (Warren-Findlow, Seymour, & Brunner Huber, 2012). Focusing on a similar population, a hypothesis that medication adherence and self-efficacy have a significant relationship was proven (Francois, 2015), also the finding that patients who have high self-efficacy reported tendency of high medication adherence and better control of hypertensive symptoms were found (Elder et al., 2012).

An inverse relationship between type D personality and medication self-efficacy was found. This finding agrees with those which found a tendency of low medication adherence in type D personality patients (Wu et al., 2015). As well, compared in The General Self-Efficacy Scale that showed lower self-efficacy scores in those of type D personality as compared to others (Petrowski et al., 2017).

Focusing on two domains of type D personality, which are negative affectivity and social inhibition, an inverse relationship with medication self-efficacy was found. This finding can be supported by the result which both negative affectivity and social inhibition showed a negative association with self-efficacy (Shao et al., 2017). Also, there was a study reported that after discharge from the hospital for six months, 30% of patients who were type D personality have a significant lower medication adherence (Molloy et al., 2012). Also, an association between negative affectivity and medication adherence can be explained by an indirect effect of medication self-efficacy.

This study found type D personality has an inverse association with self-care behavior. Likewise, the report stated that patients with type D personality significantly have low medication adherence (Li et al., 2016). Another study showed that patients with type D personality tend to have lower levels of medication self-efficacy and medication adherence than others (Wu et al., 2015). Besides, the results of this study presented the same when each of two domains was analyzed, with both negative affectivity and social inhibition having an inverse association with self-care behavior.

Conclusions

The prevalence of type D personality in patients with hypertension at Siriraj Primary Care Unit was 14.60%. Type D personality possessed a psychological health factor which negatively affects health both direct and indirect ways, especially in medication self-efficacy and self-care behavior. Even just one of the two type D personality domains can lead to a similar detrimental result.

Abbreviations

NCDs: Non-Communicable Diseases; CHD: Coronary heart disease; NA: Negative Affectivity; SI: Social Inhibition; DS14: Type D Personality Scale-14; SPSS: Statistic Package for the Social Science

Declarations

Ethics approval and consent to participate

This study had been approved by the Siriraj Institutional Review Board (SIRB), COA no. Si 614/2018. All participants were informed and provided written consents before entering the study.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

FC analyzed and interpreted the patient data regarding the hematological disease and the transplant. RH performed the histological examination of the kidney, and was a major contributor in writing the manuscript. All authors read and approved the final manuscript.

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