Factors Predicting Stroke Pre-hospital Delay Behavior Intention among People with High Risk of Stroke

Wanpen Waelveerakup, Punyarat Lapvongwatana*, Sirirat Leelacharas, Jean Davison

Abstract: Recombinant tissue plasminogen activator has been recommended and widely used in treating acute ischemic stroke. Unfortunately, the critical period for medical effectiveness is relatively short, and many people with stroke cannot access a hospital in time. This study aimed to determine factors predicting stroke pre-hospital delay behavior intention among people with high risk of stroke. In this cross-sectional study, people with high risk of stroke and their family members (n = 93 pairs) were recruited from a semi-rural province in central Thailand. The questionnaires used in this study included socio-demographic, dependency, stroke literacy, family relationship, and stroke pre-hospital delay behavior intention scales. Data were analyzed using descriptive statistics, Pearson's product-moment correlation coefficient, and multiple regressions.

The results revealed that dependency, number of family members, stroke literacy and family members' stroke literacy were negatively correlated with stroke pre-hospital delay behavior intention among people with high risk of stroke. The latter was positively correlated with family members' stroke pre-hospital delay behavior intention. In a regression analysis, the family members' stroke pre-hospital delay behavior intention, stroke literacy, and dependence collectively accounted for 58.2% of stroke pre-hospital delay behavior intention. The findings suggest that nurses can develop an intervention to decrease stroke pre-hospital delay behavior intention by increasing stroke literacy of both people with high risk of stroke and family members, and promptly ask for help (dependency). These actions may help facilitate people to receive timely medical treatment.

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Introduction

Stroke is the second leading cause of death worldwide,[1] and in Thailand, the site of this study men have a higher death rate and a slightly higher rate of long-term disability from stroke.[2] Data from the Ministry of Public Health for 2011-2015 showed the stroke mortality rate increasing dramatically

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(30.0, 32.0, 35.1, 38.0 and 43.5 per 100,000 population, respectively).[3,4] A previous study estimated that at least one new stroke occurs in Thailand every 2 minutes.[5] Additionally, the Thai Epidemiology Stroke Study found the prevalence of stroke in populations over the age of 45 years was 1.9%.[4] Stroke prevalence differed among five geographic regions of the country with the Bangkok Metropolitan area having the highest prevalence followed by Thailand's central region.[4]

Empirical evidences[6-7] consistently support thrombolysis treatment with recombinant tissue plasminogen activator [rt-PA] as one of the most biologically active therapies for acute ischemic stroke. However, the efficacy time window for the drug decreases dramatically while the risk of complications, such as intracranial hemorrhage and death, increases with passing time. Recent studies demonstrated that deaths increase when treatment is started more than 4.5 hours after initial symptoms.[6-7] These findings highlight the fact that the number of people receiving early treatment and could potentially benefit from this remains small. For the years 2010-2015, stroke centers using rt-PA within the potentially beneficial period reached only about 5% of people with stroke in developed countries[7] and about 1.1 - 3.8% in Thailand.[2,5] The primary reason for the exclusion of thrombolysis treatment was pre-hospital delays.[8-10]

Pre-hospital delays [PHD] refer to people arriving at a stroke unit after >180 minutes.[11] Thai stroke guideline committees also proposed that any suspected stroke case needs to reach a stroke unit within 3 hours and 1.5 hours more are needed for investigation and treatment preparation.[11] During the years 2013-2016, several studies in Thailand revealed the time until hospital arrival among people with acute stroke ranged from 50 - 301 minutes.[12-15]

To decrease PHD, it is necessary to understand stroke pre-hospital delay behavior intention [SPDBI] to seek health care and the association of factors among people with a high risk of stroke. SPDBI is defined as the subjective probability of participants or family members engaging in delayed treatment from the time of stroke symptom appearance to reaching a hospital without providing stroke fast track.[16] The decision delay is believed to occur from the lack of awareness regarding stroke symptoms and the hesitation to call the EMS[17] and how people make sense of symptoms and their level of motivation to seek help.[18] Yang and colleagues[19] suggested that to decrease SPDBI, improve knowledge, and enhance stroke pre-symptoms alert can reduce the possibility of PHD. Since positive intention is a mobilizer of proper actual behavior. As the time of hospital arrival is vital for decisions about stroke treatment, it is crucial that people with high risk of stroke (PWHRS) and bystanders need to know about, immediately decide, and act promptly when there is a stroke event.[10-11]

Eventually, most studies have emphasized after-stroke care and time delay in seeking help. Little is known about factors influencing SPDBI, early detection when stroke symptoms occur, and about assessing the probability of a PHD. Therefore, SPDBI and factors predicting behaviors among PWHRS and family members/bystanders need to be further explored.

Review of Literature and Conceptual Framework

Previous studies have focused on judging whether there is a delay time from stroke onset to hospital registration and related factors.[13-5, 17-20] There is limited literature about SPDBI which might help to understand the issues about actual delay behaviors. A pre-hospital delay is related to various factors; and delays en route to the hospital can be divided into three levels on the acute stroke pathway: primary, secondary and tertiary delays.[17-21] Primary delays include a lack of recognition of stroke or serious symptoms or a lack of response to these symptoms. Previous evidence suggests that a delay in seeking medical attention after the onset of stroke symptoms is an important reason for underuse of thrombolytic therapy.[12,17] Some studies show that many PWHRS do not realize stroke dangers,[14-15,17] feel anxious when symptoms occur,[12,13] or feel afraid of what will ensue when the symptoms appear.[13] And these feelings can

lead to a lack of adherence to preventive treatment and delay in calling for help. The majority of the patients not adhering to treatment and seeking healthcare services in time had knowledge deficits about the causes, signs, and symptoms, and need for early treatment and care.[17-18, 20-22] Secondary delays included initial contact with non-emergency health services.[8,15,20] Previous studies showed that people with suspected stroke stopped at primary care facilities first, which led to more delay in reaching a potential hospital.[20] Other studies revealed that living with others was strongly associated with the early calling of Emergency Medical Services [EMS], leading to a decreased arrival time to reach a hospital.[8,17,23] Lastly, a tertiary delay means that patients' presenting symptoms often are not diagnosed properly by a health service provider, leading to increased time in reaching a hospital.[8, 23]

In summary, several complex factors are associated with the delay of people with suspected stroke arriving at a hospital and these are considered stressors. These factors indicate the need for a framework that considers the influence of multi-level factors to formulate an understanding of PHD among PWHRS. The Neuman System Model [NSM][24] can be used to guide the selection of variables for complex problems and was applied as the conceptual framework in this study. The NSM provides a systematic perspective to assess all stressors including intrapersonal, interpersonal and extrapersonal stressors in five areas: physiological, psychological, sociocultural, developmental, and spiritual. The selected variables included physiological variables (stroke literacy), psychological variables (dependency), sociocultural variables (community participation, and living conditions), developmental variables (age and educational level), and spiritual variables (religious ritual). Moreover, interpersonal stressors selected for this research included: family members' stroke pre-hospital delay behavior intention, family members' stroke literacy, and family relationship.

The major problem is that people with suspected stroke arrive at a hospital late and no longer meet the criteria for rt-PA treatment. The five variables of people and environmental stressors might influence SPDBI. Those selected variables were tested for their relation to and predictiveness for SPDBI of the PWHRS in this research.

Study Aim
To determine factors predicting stroke pre-hospital delay behavior intention among people with high risk of stroke.

Methods

Design
A cross-sectional, correlational research design was employed.

Setting
The setting was a selected district with five sub-districts, in a semi-rural province in central Thailand (about 60 kilometers from Bangkok), with a population of 880,692 people within 170,198 households.[25] There was a higher stroke mortality rate than the average in the whole Kingdom of Thailand.[3,25] Moreover, the stroke morbidity rate in this setting was at the 9th highest prevalence in Thailand.[25] Therefore, PWHRS were recruited from these communities.

Participants
The sample size was based on the calculation for multiple regression.[26] This study's sample was estimated based on ten independent variables as possible predicting factors, an acceptable level of power of 0.95, the important criterion of p<0.05, and an effect size of 0.35. The sample size required was 80 participants. For family members, the sample size also evened and paired. At the end of the year 2016, 957 of 1,026 people with hypertension or diabetes in the research area underwent stroke screening by the government project. A total of 112 of 957 PWHRS were identified by the risk prediction chart developed by the Thai CV Risk Score Development Group[27] which laid out the risk levels of individuals by gender, age, systolic blood pressure, total blood cholesterol, smoking status and present or absence of diabetes mellitus. It expressed risk using a color chart with green, risk of <10%; yellow, risk of 10-20%; orange, risk of 20-30%; red, risk of 30-40%; and deep red, risk >40%. In this study, a population of PWHRS (N = 112), risk ≥ 30%, was recruited during February – March 2017. However, 19 PWHRS were excluded from the study because of contact limitations or response conditions. Finally, the participants were 93 PWHRS and their

paired 93 family members. The extra 13 participants (16.3 % of the total participants) were included to offset any missing subjects.

Inclusion criteria for PWHRS were as follows: 1) individuals diagnosed with hypertension or diabetes, who had been identified as high risk of stroke 2) able to communicate in the Thai language, and 3) aged ≥ 18 years old. For family members, inclusion criteria were as follows: 1) be a sibling or offspring, spouse, employee or other significant people for the participants who provide any physical and/or emotional care for the participants or spend time with the participants; 2) able to communicate in Thai language; and 3) aged ≥ 18 years old.

Exclusion criteria of PWHRS were as follows: 1) those sick from a stroke at the beginning of the research; 2) a history of comorbidity with uncontrolled heart disease, active renal failure, or other active diseases; and 3) did not stay in the research setting during the research period. For family members, the exclusion criterion included individuals who were absent from the research setting during the research period.

Ethical Considerations

Approval was obtained from the Ethical Committee of the Faculty of Public Health, Mahidol University (MUPH 2016-138). The potential participants were informed of the purpose of the study and also told about their right to withdraw from the study at any time without losing any benefits of their health care services. The signed consent was obtained from all participants after they agreed to participate.

Instruments

There were five instruments which were administered in Thai: 1) socio-demographic questionnaire; 2) Dependency scale; 3) Stroke literacy scale for PWHRS or family members; 4) A family relationship scale, and 5) The Stroke Pre-hospital Delay Behavior Intention Scale for PWHRS or family members.

The researchers developed the first 3 instruments using a literature review to inform their development. The content validity of dependency scale, stroke literacy scale for PWHRS or family members were verified by seven experts including four academic stroke experts, one physician, and two measurement experts. The CVI of the two newly developed instruments, the internal consistency reliability of all instruments except the Socio-demographics Questionnaire were tested with PWHRS and their family members (n = 30 pairs). All values of each measure of try out and of actual reliability are shown in **Table 1**.

Table 1 Psychometric properties of the instruments

Variables	CVI	IOC	KR-21*		Cronbach's alpha reliability	
			Pre-test	Actual	Pre-test α	Actual α
1. PWHRS' socio-demographics		0.92	–	–	–	–
2. Family members' socio-demographics	–	0.84	–	–	–	–
3. PSPDBI	0.86	–	–	–	0.87	0.90
4. FSPDBI	0.91	–	–	–	0.87	0.88
5. PSL	–	0.92	0.89	0.87	–	–
6. FSL	–	0.95	0.90	0.90	–	–
7. Dependency	0.93	–	–	–	0.87	0.89
8. FR	0.98	–	–	–	0.84	0.88

Note. * = Kuder – Richardson's method,
IOC = Index of Item-Objective Congruence, CVI = Content Validity Index
PSPDBI = PWHRS' stroke pre-hospital delay behavior intention,
FSPDBI = Family members' stroke pre-hospital delay behavior intention,
PSL = PWHRS' stroke literacy, FSL = Family members' stroke literacy,
FR= Family relationship,

The Socio-demographics Questionnaire. The questions focus on variables such as age, gender, underlying disease, education level, number of people living in the household, the family's economic status, community participation and frequency of community activities per month, and practice of religious rituals. For religious observance, the questions asked how often participants have a solely religious activity per week.

The Dependency Scale. This is a 10-item Likert-style self-report measuring psychological dependence/detachment when respondents get sick with chronic diseases. It contains a series of statements focusing on perceived discomfort or guilt when receiving help from someone else and privacy needs. The scale had two subscales: 5 items evaluated perceived discomfort or guilt when receiving help from someone else and five items measured privacy needs. Responses to the positive items ranged from 5 (strongly true) to 1 (not true). Rating scores are reversed for negative items. The total score ranges from 1- 50 with a higher score indicating a higher dependency. A score of 1.0 - 29.9 (0 - 59.9%)[28] means a low level of dependence, whilst 30.0 - 39.9 (60 - 79.9%)[28] equates to a moderate level of dependency, and a score of 40.0 - 50.0 (80 - 100.0%)[28] is a high level of dependency.

The Stroke Literacy Scale [SLS]. This is a comprehensive self-report instrument focused on two areas: knowledge about stroke, and awareness on immediate actions to stroke events. The knowledge area consists of 46 items with a scoring of "incorrect" = 0, and "correct" = 1. It includes risk factors (15 items), basic pathology (1 item), signs and symptoms (12 items), management (3 items), health insurance (1 item), and stroke prevention (14 items). Awareness of immediate actions to stroke events consist of 10 items using a 3-Likert scale of 0 (disagree) to 2 (agree). There are two sets of the SLS for PWHRS [PSL] and family members [FSL]. For example, for the PWHRS, a question is: "What will you do if you observe any signs and symptoms of stroke occurring?" For family members, the question is "What will you do if you observe

a family member having any signs and symptoms of stroke. Total scores of both questionnaires range from 0 − 66, with a higher score indicating higher stroke literacy [SL]. A score of 0.0-39.5 (0 - 59.9%)[28] means a low level of SL, 39.6 − 52.7 (60 - 79.9%)[28] a moderate level of SL, and a score of 52.8 − 66.0 (80 − 100.0%)[28] is considered a high level of SL.

Family Relationship Scale [FRS]. The FRS is a comprehensive self-report instrument. The instrument was adapted from Waelveerakup, Thumapiroj, and Suwannasarn in 2012.[29] It consists of 20 items with five sub-domain: joining in activities, communication, love and attachment, encouragement and support, and mutual understanding related to relationships in caring for those with chronic illness. Total scores range from 0 − 40 with a higher score indicating higher family relationship [FR]. A scores of 0.0 - 23.9 (0 - 59.9%)[28] means a limited level of FR, while 24.0 − 31.9 (60 − 79.9%)[28] is a moderate level of FR, and 32.0 − 40.0 (80 − 100.0%)[28] is considered a strong FR.

The Stroke Pre-hospital Delay Behavior Intention Scale (SPDBI). This instrument is used to measure decision making or judgment and the action of patient or family that is an obstacle to people with stroke receiving rt-PA treatment in time. The scale assesses the possibility of a PHD if stroke symptoms occur.[16] The SPDBI-Thai version was modified to fit within the Thai context from the SPDBI, developed by Zhao and colleagues[16] with permission. It was translated into Thai and back-translated into English for comparison of validity. The original scale has 27 items with five sub-domains including stroke warning signs (9 items), non-treatment justification (8 items), alternative treatment (4 items), habitual response style (3 items), and emergency system use (3 items). Part I of the original scale was deleted because of its replication with the SLS. The adapted SPDBI version consists of 18 items with four sub-domains of non-treatment justification, symptom attributions, habitual response style, and emergency system use. There are also two sets of SPDBI, one each for PWHRS [PSPDBI] and

family members [FSPDBI]. Scores range from 18 – 90 with higher score indicating higher stroke pre−hospital delay behavior intention.[16] The score of 18.0 – 53.9 (0 – 59.9%)[28] means a low level of SPDBI, while 54.0 – 71.9 (60 – 79.9%)[28] is a moderate level, and 72.0 – 90.0 (80 – 100.0%)[28] is a high level.

Data Collection

Data was collected during February – March 2017. Five research assistants were recruited from village health volunteers at selected communities. They were trained by the researchers how to collect the data and procedures for human rights protection. For those participants who could not read, the questionnaires were read out by the principal investigator (PI) or research assistants with the participants listed and answers given to the researcher or assistants.

Data Analysis

Data were entered, verified, and cleaned using Microsoft Excel and analysis undertaken using the SPSS statistics program, 18th version. The adopted level of statistical significance was p < 0.05. Descriptive statistics were used to describe the socio−demographics of the participants. Pearson's product−moment correlation coefficient was used to explore the relation between dependent and independent variables. Finally, multiple regressions were performed to examine the predictive relationship between the dependent variable and independent variables.

Results

For PWHRS, most participants were female. Participants' ages ranged from 42 to 90 years with a mean age of 72.98 years. All participants were diagnosed with hypertension and a history of comorbidity.

Most (82.7%) had an education at the primary school level. The mean year of formal education was 7.18 years. All participants were Buddhist. Participants' religious ritual practice ranged from 0 to 4 times per week with a mean frequency of 1.86 times. The number of people living in the household was from 2 to 12 persons with a mean of 4.73 persons. The frequency of participation in community activities ranged from 0 to 10 times per month with a mean of 1.14 times (Table 2).

The total score of PSPDBI were at a low level (Table 3). The PWHRS reported that they will take some time to wait and see before making a decision for action (53.6%), take a rest (51.6%) or take their own medicines (48.4%) and go to have a massage or acupuncture (31.2%) if they have any doubt about any symptoms.

For family members, most participants were female and about half (48.4%) were either daughters or sons. Participants' ages ranged from 18 to 53 years with a mean age of 32.83 years. About two−thirds of family members (67.7%) had education at primary level. The socio−demographic variables of the participants are shown in **Table 2.**

The Pearson correlation showed that the number of family members, dependency, PSL, and FSL inversely correlated with PSPDBI whereas FSPDBI was positively correlated with PSPDBI. Nonsignificant factors that correlated with PSPDBI were community participation, education level, religious ritual, and FR (Table 4).

Multiple linear regression analyses were used to determine the extent to which the group of independent variables taken together predicted PSPDBI. In the first model, FSPDBI was included and could account for 40.1% of PSPDBI. The second model included FSPDBI and PSL account for 56.0% of PSPDBI. In the third model, FSPDBI, PSL, and dependency were included, and account for 58.2 % of PSPDBI (Table 5).

Table 2 Socio-demographics characteristics of the participants (N=93)

Socio-demographics characteristics	PWHRS n (%)	Family members n (%)
Gender		
Female	74 (79.6)	73 (78.5)
Male	19 (20.4)	20 (21.5)
Age (year)		
Range	42 – 90	18 – 53
Mean (standard deviation)	72.99 (6.8)	32.8 (9.4)
Underlying disease		0 (0.0)
Hypertension with	44 (47.3)	–
Hypercholesterolemia		
Hypertension with Diabetes	27 (29.0)	–
Hypertension with Controlled Heart Disease	9 (9.7)	–
Hypertension with Diabetes with	7 (7.5)	–
Chronic Renal Failure		
Hypertension with Rheumatoid Arthritis	4 (4.3)	–
Hypertension with Migraine	1 (1.1)	–
Hypertension with Chronic Obstructive Pulmonary	1 (1.1)	–
Disease		
Education level		
Primary school	77 (82.7)	63 (67.7)
Secondary school	12 (12.9)	26 (28.0)
High vocational certificate	2 (2.2)	1 (1.1)
Bachelor degree	2 (2.2)	3 (3.2)
Number of year of formal study		
Range	6 – 16	6 – 16
Mean (standard deviation)	7.18 (2.3)	8.26 (3.3)
Living condition (number of family members, peoples)		
Range	2 – 12	2 – 12
Mean (standard deviation)	4.73 (2.2)	4.73 (2.2)
Family economic status		
Sufficient income and deposit	68 (73.1)	68 (73.1)
Sufficient income	12 (12.9)	12 (12.9)
Insufficient income and owed	9 (9.7)	9 (9.7)
Insufficient income	4 (4.3)	4 (4.3)
# community participation /month	0 – 10	–
Range	1.14 (1.6)	–
Mean (standard deviation)		
# religious ritual /week		
Range	0 – 4	–
Mean (standard deviation)	1.86 (1.2)	–
Relationship		
Daughter / Son	–	45 (48.4)
Daughter in law	–	39 (41.9)
Wife / Husband	–	5 (5.4)
Sibling / Offspring	–	4 (4.3)

\# = Frequency of

Table 3 Possible score, range, mean, standard deviation, interpretation by mean, and percentage of participants in each interpretation level of study variables

Variables	Possible score	Range	Mean (S.D.)	Interpretation by mean	Percentage of participants in each interpretation level		
					Low (0 -59.9)	Moderate (60 – 79.9)	High (80 –100)
– PSPDBI	18 – 90	18 – 81	44.0 (15.2)	Low	68.8	28.0	3.2
– FSPDBI	18 – 90	38 – 81	59.46 (7.6)	Moderate	14.0	80.6	5.4
– PSL	0 – 66	7 – 52	25.55 (12.2)	Low	82.8	17.2	0.0
– FSL	0 – 66	5 – 48	19.72 (8.3)	Low	96.8	3.2	0.0
– Dependency	1 – 50	14 – 43	31 (5.5)	Moderate	35.5	61.3	3.2
– FR	0 – 40	14 – 28	19.98 (2.8)	Limited	89.2	10.8	0.0

Note. PSPDBI = PWHRS' stroke pre-hospital delay behavior intention,

FSPDBI = Family members' stroke pre-hospital delay behavior intention,

PSL = PWHRS' stroke literacy, FSL = Family members' stroke literacy,

FR= Family relationship,

Table 4 Correlations between predictor variables and SPDBI

Variable	1	2	3	4	5	6	7	8	9	10
Predictor variables										
1. Age	1									
2. Dependency	.09	1								
3. Community participation,	−.04	−.07	1							
4. Living condition	.05	.27**	−.13	1						
5. Education level	−.13	.12	−.02	.09	1					
6. PSL	.13	.02	.12	.02	−.10	1				
7. Religious ritual	−.03	−.19	.35**	−.09	−.07	.15	1			
8. FSL	.08	.11	.13	.03	.08	.94**	.17	1		
9. FSPDBI	.06	−.17	−.03	−.02	.01	−.18	.04	−.22*	1	
10. FR	.14	.02	−.02	.14	−.19	−.01	−.03	−.01	.04	1
PSPDBI	.01	−.32**	.04	−.24*	−.01	−.51**	.06	−.46**	.63**	.04

Note. * p < .05, ** p < .001,

PSL = PWHRS' stroke literacy, FSL = Family members' stroke literacy,

FSPDBI = Family members' stroke pre-hospital delay behavior intention,

PSPDBI = PWHRS' stroke pre-hospital delay behavior intention,

FR = Family relationship

Table 5 Regression Analysis summary for predicting PSPDBI of PWHRS

Variables	B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	p-value
Model 1					
(Constant)	−30.98	9.83		−3.15	0.002
1. FSPDBI	1.26	0.16	0.63	7.72	<0.001
Model 2					
(Constant)	−9.31	9.30		−1.00	0.320
1. FSPDBI	1.12	0.14	0.56	7.77	<0.001
2. PSL	−0.51	0.90	−0.41	−5.64	<0.001
Model 3					
(Constant)	5.32	11.43		− 466	0.64
1. FSPDBI	1.07	0.14	0.54	7.55	<0.001
2. PSL	− 0.48	0.09	− 0.38	− 5.23	<0.001
3. Dependency	− 0.42	0.20	− 0.15	− 2.12	0.037

Model 1: R= 0.63; R^2 = 0.40; Adjusted R^2 = 0.39; F= 59.55; p<0.001

Model 2: R= 0.75; R^2 = 0.56; Adjusted R^2 = 0.55; F= 55.98; p<0.001

Model 3: R= 0.76; R^2 = 0.58; Adjusted R^2 = 0.57; F= 40.31; p<0.001

Note. FSPDBI = Family members' stroke pre-hospital delay behavior intention,

PSPDBI = PWHRS' stroke pre-hospital delay behavior intention,

PSL = PWHRS' stroke literacy

Discussion

The results revealed that about two-thirds of PWHRS (68.8%) had a low level of PSPDBI score which meant that the PWHRS had a good intention to get into the hospital as soon as any signs/symptoms were observed since some were in a good care of a health system. These communities were in a good hand for stroke prevention and treatment.

However, one-third of PWHRS (31.2%) had a moderate and a high scores of PSPDBI. They would: delay by taking 'wait and see' time before making a decision; take a rest; or take their own medicines if they had any doubt about signs/symptoms of stroke at 53.6%, 51.6%, and 48.4%, respectively. They would go to have a massage or acupuncture if they were sick with any signs or symptoms. Additionally, the mean age of the participants was high (72 years)

so that if the participants developed an acute stroke, they might have difficulty to take themselves to a hospital. This might as well reflect in any other ages. With the facing situation of acute stroke, the PWHRS might have less ability to manipulate themselves to get into stroke fast track; therefore the closed helpers were their family members or luckily educated bystanders. Moreover, a recent study in Thailand revealed that care for survivors of stroke is mainly provided by family members. [30]

The first predictor revealed that the FSPDBI was the best predictor of PSPDBI. However, the FSPDBI score was at a moderate level which meant that it might cause a delay to get the PWHRS to a hospital within a golden time period. Family members/bystanders were the most important person and the best predictor to make a proper decision for seeking help or directly transport the PWHRS to a potential

hospital in time. Therefore, family members or witnesses to stroke should play important roles in minimizing pre-hospital delay in order to minimize the areas of the brain damages that control both perception and ability to communicate. This was also congruent with previous studies that an appropriate early contact with the EMS system reduced pre-hospital delay.[31-32] Additionally, about a half of the family members (48.8%) were a daughter or son who were the closest helpers for their family stroke acute events. In Thai culture, daughter or son are usually responsible for taking care of their family members' sicknesses. When facing situation of an acute stroke, a daughter or son will contact the system to ask for help in order to reach stroke fast track.

The second predictor was PSL. This study revealed that PSL was at a low level which meant that the PWHRS had poor knowledge and awareness on immediate actions to stroke events for reaching the potential hospital if any signs/symptoms of stroke occurred. The results showed that the FSL is strongly correlated with FSPDBI and both variables are significantly associated with PSPDBI. The SL includes knowledge about stroke, an awareness about stroke warning signs, risk factors and the ability of a patient to gain access to, understand and use stroke information in ways which promote and maintain health. Therefore, it leads a family member to make decisions about going to the hospital in time whenever any warning signs and symptoms of stroke occurred. This study was congruent with several previous studies that many individuals with warning signs of stroke did not realize stroke dangers which could lead to a delay in calling for help.[8,12-14,33]

The last predictor was dependency, which psychologically is reflected in bodily response and internal function[24] such as dependency which makes PWHRS wish to be close to and get help or assistance from others when symptoms of stroke occur. Also, stroke severity and living with others is strongly associated with calling the EMS early, leading to less delay in

hospital arrival.[17] Dependency is one of the factors that influences health behaviors that lead to decreasing pre-hospital delay. Fowler and colleagues[35] found dependence showed increased attachment/treatment compliance among women. In this study, most of the participants was female, and 35.5% of the participants prized their personal privacy and felt discomfort or guilt when asking help from family members. The psychological variable (dependency) was correlated with sociocultural variables (number of family members) which means that the normal line of defense (number of family members) and the flexible line of defense (dependency) is a dynamic buffer that mediates the temporary response of the family members in daily life. This interaction has influenced the patient to more likely reach the hospital late. Our findings are supported by the NSM which postulate that all processes of life of the people's internal system influence how the people responses to stressors.

This study revealed that age, community participation, education level, and religious ritual did not correlate with PSPDBI. This study investigated the likelihood of participants' action at stroke onset. Some developmental factors such as age did not correlate with PSPDBI. It is possible that majority of the participants were self-help older persons. Community participation was quite low in this study so it might not have impacted participants' behaviors. Since no other studies were found that explored those relationships, there were no findings for comparison.

Family relationships were limited since most families were nuclear families. However, young people and family members usually take care of sick or older adults in Thai culture.[33] This finding was inconsistent with a previous study[29] that found relationships between family members in the central part of Thailand were moderate level which related to taking care of each other.

Religious ritual was not correlated with PSPDBI. There might be because all the participants were born Buddhists. Level of education did not correlate with

PSPDBI since most of the participants had similar educations, completion of primary school. Thai people face no difficulty with access to health services. This finding was inconsistent with previous studies in the US that found that education level impacted pre-hospital time,[8] but was consistent with an earlier study in Bangkok, Thailand.[12]

Limitation

A limitation of this study is that it used a cross-sectional design, which cannot provide a casual determination between dependent and independent variables. However, the findings are beneficial for situation analysis of our main project that will be further developed as a community care model for any suspected stroke patients. Findings may not be generalizable to those who live in a different context.

Conclusions and Implications for Nursing Practice

Our findings support the notion that processes of life of the people's internal system (psychological and sociocultural environments) influence how people respond to a stressor and to interpersonal stressors (FSPDBI). A family member is a most significant helper to shorten the pre-hospital delay. The PWHRS is also responsible for provoking family member awareness about the occurrence of his/her stroke and prompt decision making. Nurses can develop a intervention to decrease PSPDBI by strengthening caring skill of family for people with acute stroke and prompt seeking help as well as appropriate EMS use. For PWHRS, nurses can develop the intervention to enhances PSL and increase dependency through consulting others concerning and in seeking appropriate assistance to respond to early warning signs and symptoms of acute stroke

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ปัจจัยทำนายพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง

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บทคัดย่อ: ยาละลายลิ่มเลือด (recombinant tissue plasminogen activator) เป็นยาที่แนะนำให้ใช้เพื่อรักษาโรคหลอดเลือดสมองตีบเฉียบพลันและปัจจุบันมีการใช้กันอย่างแพร่หลาย แต่ยานี้มีข้อจำกัดคือระยะเวลาที่การรักษามีประสิทธิภาพจะต้องกระทำอย่างรวดเร็วหลังเกิดอาการ จึงทำให้ผู้ป่วยโรคหลอดเลือดสมองจำนวนมากไม่สามารถเข้าถึงโรงพยาบาลได้ทันเวลาสำหรับช่วงเวลาที่ยาให้ผลการรักษาที่ดี การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่ทำนายพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของผู้ป่วยกลุ่มเสี่ยงสูงต่อโรคหลอดเลือดสมอง การศึกษานี้ใช้รูปแบบการศึกษาแบบภาคตัดขวาง โดยคัดเลือกผู้ป่วยกลุ่มเสี่ยงสูงต่อโรคหลอดเลือดสมองและสมาชิกในครอบครัว จากจังหวัดกึ่งชนบทในเขตภาคกลางของประเทศไทย จำนวน 93 คู่ เก็บรวบรวมข้อมูลโดยใช้แบบสอบถาม ได้แก่ แบบสอบถามข้อมูลเกี่ยวกับคุณลักษณะทางสังคม แบบวัดการพึ่งพา ความรอบรู้เกี่ยวกับโรคหลอดเลือดสมอง สัมพันธภาพในครอบครัว และแบบวัดพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้า วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา สัมประสิทธิ์สหสัมพันธ์เพียร์สัน และสถิติการถดถอยพหุคูณ ผลการวิจัยพบว่า การพึ่งพา จำนวนสมาชิกในครอบครัว ความรอบรู้เกี่ยวกับโรคหลอดเลือดสมองของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง และความรอบรู้เกี่ยวกับโรคหลอดเลือดสมองของสมาชิกในครอบครัวมีความสัมพันธ์ในทางกลับกันกับพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง แต่ของสมาชิกในครอบครัวมีความสัมพันธ์ทางเดียวกันกับพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง จากการวิเคราะห์การถดถอยพหุคูณ พบว่า พฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของสมาชิกในครอบครัว ความรอบรู้เกี่ยวกับโรคหลอดเลือดสมอง และการพึ่งพาของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง สามารถร่วมกันทำนายความความแปรปรวนของพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าได้ ร้อยละ 58.2 ผลการวิจัยครั้งนี้ชี้ให้พยาบาลพัฒนารูปแบบการดูแลผู้ป่วยก่อนส่งถึงโรงพยาบาล โดยพัฒนาการปฏิบัติการที่สามารถลดพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของสมาชิกในครอบครัว เพิ่มความรอบรู้เกี่ยวกับโรคหลอดเลือดของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง และสมาชิกในครอบครัว และเพิ่มการขอความช่วยเหลืออย่างเหมาะสม (การพึ่งพา) ซึ่งจะช่วยให้ผู้ป่วยโรคหลอดเลือดสมองเฉียบพลันเข้าถึงการรักษาด้วยยาละลายลิ่มเลือดได้รวดเร็วทันเวลา

คำสำคัญ: พฤติกรรมความตั้งใจ การพึ่งพา ครอบครัว ความเสี่ยงต่อโรคหลอดเลือดสมอง โรคหลอดเลือดสมอง ความรอบรู้เกี่ยวกับโรคหลอดเลือดสมอง

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