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The Development of a Quality-of-Life Assessment Tool for Older Adults with Hypertension: A Case Study in Thailand

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Abstract

This study aimed to 1) develop a quality-of-life assessment tool for older adults with hypertension and 2) examine the reliability and validity of the assessment tool. This is a descriptive study, conducted in 382 Thai older adults with hypertension in Bangkok. The results revealed that the quality-of-life assessment tool for older adults with hypertension consisted of 3 domains, i.e., physical, psychological, and social relationship. There were totally 22 questions, with content validity (IOC) = 0.8-1.0, Cronbach's alpha = .884, and Intraclass Correlation Coefficient (ICC) = .820. According to the test-retest reliability, the correlation was excellent (Correlation Coefficient = .860). Therefore, quality of the developed quality-of-life assessment tool for older adults with hypertension was high and can be applied to assess quality of life for older adults with hypertension efficiently.

Keywords: Quality of life, older adults, hypertension, Thailand

Introduction

Hypertension is a major risk of cardiovascular diseases and cerebrovascular disease (CVD). Patients are required to receive medications for their entire life. Besides, it is also a major cause of death in older adults; and a major public health problem worldwide that gets more severe every year (Altajori & Elshrek, 2017).

According to the report from the World Health Organization (WHO), hypertension has been a cause of the death toll up to 7.5 million or 12.8% of the total causes of death. Nearly one billion patients with hypertension have been found worldwide. What is more, it has been predicted that the population with hypertension will increase to 1.56 billion more in 2025, mostly caused by the changing way of life, e.g., sedentary lifestyle, consuming food with high salt and fats, drinking, and smoking. As a result, hypertension increases (WHO,2013).

According to studies on epidemiology in Thailand during the past decade, there is a clear data of rapid increase of hypertension incidence in Thailand. It has been found in the age range between 40- 65 years and over. The population aged over 65 years has 2 times higher hypertension incidence than other age ranges (Ministry of Public Health, 2016). And according to the report from the Ministry of Public Health, there are 3,761,431 older adults with hypertension out of 8,089,151 among older adults aged 60 year and over. They receive medical treatment in public health facilities in 12 areas across Thailand. And the mortality rate has kept increasing continually. In 2018, the death toll caused by hypertension was high up to 132,868. The incidence of the sickness and hypertension treatment tends to increase continually (ThaiNCD,2020).

Unless this problem is solved properly, it will affect quality of life among older adults. Regarding the physical domain, older adults with hypertension will be less capable of doing activities of daily living (ADL) due to abnormalities of the cardiovascular system and functions. As a result, older adults with hypertension will get fatigued, tired easily, and palpitation. Some also have a chest pain during hard exertion or work (Ukpabi & Ewelike,2017). Regarding the psychological domain, when older adults with hypertension perceive their sickness, they will feel stressed and worried. They will fear of death, with low self-worth. Some many even feel down and want to give in. Regarding the social domain, their work ability will reduce. This finally results in the reduction of roles and responsibilities toward families and the society (Thai hypertension, 2019. Regarding the economic domain, older adults with hypertension spend a lot of money on the

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medical expense around 7,927.00 baht on average per person per year. In case of other complications such as CVD, the medical expense will increase up to 41,261.00 baht on average per person per year. It is rather high, and it is a major problem among older adults with work limitation. They cannot work with full ability, resulting in lack of family income and insufficient money for hypertension treatment (ThaiNCD,2020).

However, to acknowledge problems and effects on older adults with hypertension right at the points requires the results of quality-of-life assessment among older adults. Nowadays, quality of life assessment for older adults with hypertension usually relies on WHOQOL-BREF, a quality-of-life assessment tool, as a short form of WHOQOL-100. There are totally 26 questions, divided into 4 dimensions, i.e., physical, psychological, social, and environmental. The other 2 questions are about general health and overall quality of life. Each question is about quality of life during the past 2 weeks (Ilic et al., 2019) and the 36-Item Short Form Health Survey (SF-36), divided into 8 dimensions, i.e., physical function, role limitation due to physical problem, role limitation due to emotional problems, body pain, psychological health, vitality, social functioning, general health perception. Each dimension contains different questions. And each question is about health status during the past 4 weeks (Jacobsen EL et al., 2018).

According to literature review, no specific quality-of-life assessment tools for older adults with hypertension have been found yet. Therefore, the researchers came up with an idea to develop a quality-of-life assessment tool for older adults with hypertension. The objectives were to develop the assessment tool and to measure validity of the developed quality-of-life assessment tool for older adults with hypertension. The form is expected to be applied for medical and public health benefits in the future.

Review of literature

Quality of life is necessary and gains widespread attention because it is a key indicator of livelihood development among national populations. WHO defines quality of life as an individual's perception of determining their goals and expectations of living related the contexts of the society, culture, and livelihood (Vahedi, 2010). It also sets 6 domains for quality-of-life assessment (WHOQOL, 2020) as follows.

1) Physical domain: It refers to individuals perceived physical domain that affects daily life, e.g., perceived physical strength and perfection, perceived well-being with no pain, perceived ability to deal with physical pain, perceived force to daily living, perceived sleep and rest, and perceived sexual activity.
2) Psychological domain: It refers to perceived psychological state of their own, e.g., perceived positive feelings; perceived self-image; perceived self-esteem; perceived self-confidence; perceived thinking, memory, concentration, decision; perceived ability to learn their own stories, and perceived ability to manage sorrow or worries.
3) Level of independence: It refers to perceived autonomy, perceived mobility, perceived activities of daily living, perceived work capacity, and perceived independence from medicinal substances and medical aids.
4) Social relationship: It refers to perceived personal relationship, perceived social support, perceived activities as provider/supporter, and perceived sexual emotions or sexual activity.
5) Environment: It refers to perceived environment that affects daily living, e.g., perceived freedom, physical safety, and security; perceived physical environment without pollutions, and perceived convenient transport.
6) Spiritual/Religious/Personal beliefs: It refers to perceive their own beliefs that affect daily living, e.g., perceived spiritual and religious beliefs; perceived meanings of life, other beliefs that affect daily living, and overcoming obstacles in life.

Later, the quality-of-life development team of WHO has rearranged the quality-of-life domains. Some were combined altogether, i.e., physical and independence, and psychological and personal beliefs. Therefore, the domains were shortened to 4, i.e., 1) physical, 2) psychological 3) social relationship, and 4) and environmental (Ha et al, 2014; Liu et al,2013; Lucas-Carrasco et al, 2011).

Moreover, quality of life concepts is also applied to assess health status among patients. A number of researchers have developed tools for health-relate quality of life assessment in order to investigate effects of physical, psychological, social, and other domains related to living (Megari, 2013) as follows.

1) Short Form 36: It is a quality-of-life assessment tool related to incidence of disease and has been widely applied, both overseas and in Thailand. The form consists of 8 domains for assessment, i.e., 1) physical functioning, 2) role limitation due to physical problem, 3) body pain, 4) general health perception, 5) vitality, 6) social functioning, 7) role limitation due to emotional problem, and 8) mental Health. Each dimension

contains different numbers of questions. Each question is about health status during the past 4 weeks. Scores of SF-36will be reported according to each of 8 dimensions, between 0-100 points. High scores represent better quality of life (Katsi et al, 2017; Lins & Carvalho, 2016).

2) Nottingham Health Profile (NHP): It is an assessment tool developed and designed for quality-of-life assessment among general people about individuals' perception or feelings when undergoing different kinds of sickness. This form consists of assessment in 6 dimensions, i.e., 1) energy level, 2) emotional reaction, 3) physical mobility, 4) pain, 5) social isolation, and 6) sleep (Heaney et al, 2020; Reis et al, 2018).
3) Sickness Impact Profile (SIP): It is a quality-of-life questionnaire developed for assessing effects of sickness on activities and routines. The form consists of 136 questions, divided into 12 dimensions, i.e., 1) ambulation, 2) mobility, 3) body care and movement, 4) communication, 5) alertness behavior, 6) emotional behavior, 7) social interaction, 8) sleep and rest, 9) eating, 10) work, 11) home management and 12) reaction and pastimes. (Krabbe et al, 2017; Bowers et al, 2009).

Therefore, according to literature review as aforementioned, the current quality-of-life assessment tools mostly relate to general incidence of diseases. No specific quality-of-life assessment tools for older adults with hypertension have been found yet. Therefore, Therefore, the researcher had an idea to develop a quality-of-life assessment tool for older adults with hypertension.

Research Methodology

This study was divided into 2 phases, i.e., Phase 1 : The development of the quality-of-life assessment tool for older adults with hypertension, and Phase 2: Examining reliability and validity of the assessment tool.

In Phase 1, the researcher reviewed documents, theories, concepts, and research articles related to quality of life among older adults with hypertension. Characteristics of their quality of life were studied by an interview of 2 questions for the interview were designed to meet the objectives, i.e., 1) "Do you think what the meaning of good quality of life among older adults with hypertension should be? 2) Do you think which dimensions should be included in quality of life assessment among older adults? Why? The questions were applied for the interview with 12 medical personnel from government and public hospitals, i.e., 2 Physical Medicine and Rehabilitation physicians, 4 physiotherapists, 2 nurses, and 4 older adults with hypertension. Then, the data obtained from no. 1 and 2 was synthesized. The meaning and characteristics of quality of life among older adults with hypertension can be concluded as follows.

Quality of life among older adults with hypertension refers to good livelihood according to basic needs in life. It also includes responding to physical, psychological, emotional, and social needs; and satisfaction in life, self-worth, morale, happiness, and self-adaptation among male and female older adults aged between 60-69 years at early-stage hypertension with blood pressure between 140/90 – 150/99 mmHg. It is divided into 3 domains, i.e., physical, psychological, and social relationship as follows.

1) Physical domain: It refers to readiness among older adults with hypertension to take care of themselves, implying that they understand causes, pathological conditions, and effects of hypertension; and that they are aware of self-care with discipline in term of taking drugs regularly as directed by physicians, regular blood pressure measurement, diet control, and regular exercise. It also includes the ability to manage undesirable symptoms confidently and efficiently in their daily life, i.e., feeling faint, dizziness, and tremor.
2) Psychological domain: It refers to emotional stability of older adults for being able to perceive their own emotions and to manage emotional states caused by stress, anxiety, and depressive disorder; with self-esteem, happiness, and satisfaction with self-reliance.
3) Social relationship domain: It refers to readiness for sociability and being able to suggest or exchange experiences in self-care regarding the sickness to friends and people around with confidence; and to perceive the worth and importance of themselves for being useful to the society.

After that, the researcher developed the quality-of-life assessment tool for older adults with hypertension, with the contents of questions conforming to the definitions and practices consisting of 3 domains, i.e., physical, psychological, and social relationship. There were totally 22 questions, consisting of 11 questions about the physical domain, 6 about the psychological domain, and 5 about the social relationship domain. Likert's 5-point rating scale was applied, with both positive and negative questions. There are 4 negative questions, including items: 8,12,13,14, there is a reverse 5-point rating scale was applied. Validity was examined by content validity examination. Item

objective congruence index (IOC) was examined by 3 experts. The quality-of-life assessment tool for older adults with hypertension that passed IOC in all 22 questions was brought for tryout with 100 Thai older adults with hypertension who the samples were not.

In Phase 2, reliability and validity of the assessment tool were examined as a descriptive study among 382 Thai older adults with hypertension in Bangkok. The samples were obtained by the calculation based on Cochran's formula in case of unknown sample size (Bartlett et al.,2001), along with stratified sampling. For the inclusion criteria, the samples must 1) be male and female older adults aged between 60-69 years, 2) have early-stage hypertension with blood pressure between ≥130/80 - 140/90 mmHg, 3) receive medications, classified into 4 groups, i.e., Thiazide-type diuretics, Calcium channel blockers (CCBs), Angiotensin converting enzyme inhibitors (ACEIs), and Angiotensin receptor blockers (ARBs) 4) be able to communicate with the researcher and answer the assessment tool own their own, and 5) be willing to participate in the project and able to participate continually. All 382 participants would be assessed their quality of life through the quality-of-life assessment tool for older adults with hypertension.

Data Analysis

1. Content validity of the questions in the quality-of-life assessment tool for older adults with hypertension was analyzed by Item objective congruence index.
2. General data were analyzed by percentage.
3. Reliability of the questions in the quality-of-life assessment tool for older adults with hypertension was analyzed by Cronbach's alpha. ≥0.90 represented excellent internal consistency, ≥ 0.80 – 0.90 represented good internal consistency, ≥ 0.70 – 0.80 represented acceptable internal consistency, ≥ 0.60 –0.70 represented questionable internal consistency, ≥ 0.5-0.60 represented poor internal consistency, and ≤ 0.50 represented unacceptable internal consistency (Taber, 2018).
4. Reliability of the questions in the quality-of-life assessment tool for older adults with hypertension was analyzed, together with test-retest reliability. Pearson correlation coefficient was analyzed. The values between 0.08-1.00 represented exceptionally good relationship, 0.60-0.79 represented strong relationship, 0.40-0.59 represented moderate relationship, 0.20 - 0. 39 represented weak relationship, and the represented moderate relationship 0.00-0.19 represented very weak relationship (Mukaka M, 2012).

Research Results

1. For the results of the development of the quality-of-life assessment tool for older adults with hypertension, with the contents of questions conforming to the definitions and practices consisting of 3 domains, i.e., physical, psychological, and social relationship; and with totally 22 questions, consisting of 11 questions about the physical domain, 6 about the psychological domain, and 5 about the social relationship domain to which Likert's 5-point rating scale was applied, with both positive and negative questions; the criteria of interpreting quality of life among older adults with hypertension as follows.

Mean 92.62-110.00 represented 'Very high quality of life'
Mean 75.02-92.40 represented 'High quality of life'
Mean 57.42-74.80 represented 'Moderate quality of life'
Mean 39.82-57.20 represented 'Low quality of life'
Mean 22.00-39.60 represented 'Very low quality of life'

2. For content validity examination by IOC analysis, it was found that the quality-of-life assessment tool for older adults with hypertension had IOC index between 0.80 -1.00, representing high content validity (Turner & Carlson, 2003).
3. For characteristics of the samples, it was found that most Thai older adults with hypertension aged between 67-68 years (13.1%). There were more female than male, i.e., 73.0% of female and 27.0% of male. Most of them graduated from primary school (grade 1-6) (39.8%), started to have hypertension within 6 months to 1 year (55.5%), and received hypertension medications within 6 months to 1 year (58.9%). It was also found that 96.6% of the samples did not smoke and 88.0% did not drink (Table 1).
4. For reliability examination of the quality-of-life assessment tool for older adults with hypertension by Cronbach's alpha among 382 Thai older adults with hypertension, it was found that the physical domain (no. 1-11) had good reliability (Cronbach's alpha = .713, ICC= .665). The psychological domain (no. 12-17) had good reliability (Cronbach's alpha = .762, ICC= 706). The social relationship domain (no. 18 - 22) had excellent reliability (Cronbach's alpha = .878, ICC=.876) . It was also found that the whole quality-of-life assessment tool for older adults with hypertension had excellent reliability (Cronbach's alpha = .846, ICC=.820) (Table 2).

Table 1. **General data of the samples for the study on quality of life among Thai older adults with hypertension (n=382).**

General data		Frequency	Percentage
Age	60	27	7.1
	61	36	9.4
	62	34	8.9
	63	35	9.2
	64	36	9.4
	65	48	12.6
	66	29	7.6
	67	50	13.1
	68	50	13.1
	69	37	9.7
Sex	Meal	103	27.0
	Females	279	73.0
Duration of hypertension	6 months – 1 year	212	55.5
	> 1 year	170	44.5
Duration of medication	6 months – 1 year	225	58.9
	> 1 year	157	41.1
Smoking history	everyday	9	2.4
	some days	4	1.0
	not at all	369	96.6
Drinking history	everyday	10	2.6
	some days	36	9.4
	not at all	336	88.0

Table 2: Reliability analysis of the quality-of-life assessment tool for older adults with hypertension by Cronbach's alpha (n= 382).

	Quality of life	Item	Mean (SD)	Cronbach's	ICC
1	Physical	11	42.35 (6.19)	0.713	.665
2	Psychological	6	23.17 (4.41)	0.762	.706
3	Social relationship	5	19.82 (3.82)	0.878	.876
	Total	22	82.12 (10.07)	0.846	.820

ICC = Intraclass Correlation Coefficient

Table 3. **Reliability analysis of the quality-of-life assessment tool for older adults with hypertension by Pearson correlation coefficient (n= 40).**

Quality of life	Time of measurement	Mean (SD)	Correlation
Physical	Initial	39.10 (4.53)	.864**
	2 weeks	41.10 (3.96)	
Psychological	Initial	19.20 (2.18)	.736**
	2 weeks	18.72 (1.94)	
Social Relationship	Initial	17.65 (3.33)	.939**
	2 weeks	18.87 (3.35)	
Total QOL	Initial	75.95 (7.20)	.860**
	2 weeks	79.67 (8.07)	

** Sig ≤ .001

5. For reliability examination of the quality-of-life assessment tool for older adults with hypertension by test-retest reliability in the next 2 weeks and Pearson correlation coefficient analysis among 40 Thai older adults with hypertension, it was found that the physical domain (no. 1-11) had excellent relationship (Correlation coefficient = .864). The psychological domain (no. 12-17) had good relationship (Correlation coefficient = .736) The social relationship domain (no. 18-22) had excellent relationship (Correlation coefficient = .939). It was also found that the whole quality-of-

life assessment tool for older adults with hypertension had excellent relationship (Correlation coefficient = .860) (Table 3).

Discussion and Conclusions

The quality-of-life assessment tool for older adults with hypertension consisted of 3 domains, i.e., physical, psychological, and social relationship. This conformed to the domains of quality of life by WHO that sets the concept of developing quality of life among older adults to have good quality of life by taking care of themselves to stay healthy in 4 domains, i.e., physical, psychological, social relationship, and environmental (The WHOQOL group, 1996). This also conformed to the empirical data obtained from the interview, finding that to develop good quality of life for older adults with hypertension must consist of self-care in terms of physical, psychological, and social relationship domains. The developed assessment tool did not separate social relationship and environmental domains, because the definition of practice in the social relationship domain covered environmental domain as well. Therefore, the researcher set 3 domains of quality of life for older adults with hypertension, i.e., physical, psychological, and social relationship. The assessment tool consisted of 22 questions, with content validity evaluated by IOC index between 0.80 -1.00, representing high content validity.

For reliability examination of the quality-of-life assessment tool for older adults with hypertension, it was conducted among 382 Thai older adults with hypertension, who were the representatives from the elderly clubs in 50 areas of Bangkok. The results of reliability examination by Cronbach's alpha were high in all domains because of the similarities of the samples' characteristics in terms of age, duration of hypertension, and duration of medication. That is why this assessment tool had high reliability. And when considering reliability, it was found that Cronbach's alpha of the quality-of-life assessment tool for older adults with hypertension was close to the one of quality of life in the aging: WHOQOL-AGE, studying 9,987 older adults. The results revealed that Cronbach's alpha of WHOQOL-AGE in each domain was between 0.84-0.88 (Caballero et al, 2013).

For reliability examination of the quality-of-life assessment tool for older adults with hypertension by test-retest reliability in the next 2 weeks and Pearson correlation coefficient analysis among 40 Thai older adults with hypertension, it was found that the whole quality-of-life assessment tool for older adults with hypertension had excellent relationship (Correlation coefficient = .860). Because the quality-of-life assessment tool for older adults with hypertension was specific for only those with hypertension, the assessment results each time was not different.

Therefore, it can be concluded that the developed quality-of-life assessment tool for older adults with hypertension has high content validity and reliability and applied to assess quality-of-life assessment tool for older adults with hypertension efficiently. However, this study aimed to develop the assessment tool and to examine content validity as well as reliability of the quality-of-life assessment tool for older adults with hypertension by finding internal consistency and test-retest reliability. There should be further studies on the quality of assessment tools in some other forms, e.g., testing validity of developed assessment tool and concurrent validity of standard quality-of-life assessment tool, with larger sample size.

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Appendix

The quality-of-life assessment tool for older adults with hypertension

No.	Content	Absolutely true (5)	Mostly true (4)	Partly true (3)	Rarely true (2)	Not true (1)
1	I do not eat strong-flavored food.					
2	I do not eat high-fat food.					
3	I eat vegetables and fruits every day.					
4	I avoid alcoholic drinks.					
5	I avoid drinking coffee.					
6	I feel faint and dizzy when I change my postures quickly.					
7	In case of feeling faint and dizziness when changing postures quickly, I can deal with those symptoms.					
8	I go to see the doctor every time at the scheduled appointment.					
9	I take drugs regularly as directed by the doctor.					
10	I behave regularly as suggested by the doctor.					
11	I do exercise every day, at least for 20-30 minutes a day.					
12	I am an overthinker.					
13	I am always worried even though they are not my matters.					
14	I might have depressive disorder.					
15	I am a happy person.					
16	I am satisfied with myself.					
17	I am proud of myself.					
18	I join social activities with friends regularly.					
19	I often have meetings with friends.					
20	I can suggest friends to choose healthy food.					
21	I can suggest friends and people around to have a brilliant mind.					
22	I always find a chance to exchange experiences in self-care with friends.					