PREDICTORS OF PHYSICAL ACTIVITY IN OLDER PEOPLE WITH HYPERTENSION, BANTUL, INDONESIA

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ABSTRACT:

Background: Physical activity can bring significant health benefits to people of all ages, extend years of active independent living, reduce disability, and help to control blood pressure in older people. Adequate physical activity can be beneficial in controlling hypertension, which is an important risk factor for chronic diseases. Identifying the predictors of physical activity within a theoretical framework is important in understanding and enhancing physical activity in older people. This study aimed to identify predictors of physical activity among older people with hypertension in Bantul, Indonesia with Pender's Health Promotion Model as a guideline.

Methods: A cross-sectional design was applied. Participants were selected from four Primary Health Centers in Bantul using a multi-stage sampling method. A total of 174 older people with hypertension was recruited. They were asked to complete five questionnaires by a face-to-face interview. Multiple linear regression was used for analyzing the data.

Results: The results showed that about half of the participants performed adequate physical activity. Age, perceived barrier of physical activity, perceived self-efficacy, and social support for physical activity was significantly associate with physical activity (p<.005), while gender, income, education level, BMI, occupation, living arrangement, perceived health status was not significantly associate (p>.005). However, all variables can explain 20.1% of variance in physical activity (R^2= .201).

Conclusion: Physical activity levels can be improved by devising intervention programs which can remove perceived barriers, increase perceived self-efficacy, and provide more social support to the older people.

Keywords: Hypertension, Older people, Physical activity, Indonesia

INTRODUCTION

The prevalence of hypertension in older people is projected to increase every year. Based on 2008 report by the Ministry of Health of Indonesia, the prevalence of hypertension was 37. 4% of the total population aged 18 years and over, 29.8% of hypertension cases were among people aged over 60 years and in 2011 this has increased to 33% [1]. The rising prevalence of hypertension can be a major public health problem because it is considered one of leading risk factor for chronic diseases [1].

Physical inactivity was a factor related to occurrence of hypertension. Literature has highlighted several factors promoting prevention of chronic diseases. Physical activity is one behavior that has well-documented health benefits and is considered one of the most effective measures for preventing chronic illnesses [2]. Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure [3]. World Health Organization (WHO) [3] recommended that adults aged 65 years and over should undertake a minimum of 30 minutes of physical activity in moderate intensity at least 5 days a week.

Although physical activity has shown many benefits to individual health, many people do not appreciate its benefits. Previous study has revealed that if hypertension control was optimized, cardiac mortality would decline by 49% and by 62% for

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cerebral vascular mortality [4]. However, the statistical record in Indonesia did not meet 30 minutes of physical activity, the World Health Organization's guideline, and data [5] reveals that it was 31.9 % for male and 27.9% for female population. Moreover, the prevalence of adequate physical activity appears to decline precipitously in later life, from 44.8% among those aged 55 to 64 to 39.0% among those aged 65 and older [6].

Understanding factors predicting physical activity is essential to improve the rate of physical activity. The factors influencing physical activity are related to age, perception of physical activity, feeling confident, and support. A study by Willey et al. [7], reported that age was a factor affecting physical activity and was related to the declining muscle strength in older people. Older people's perception of their health also affects physical activity; those people who perceived good health status were more likely to perform adequate physical activity than those who perceived poor health status [8]. Perceived barrier and perceived self-efficacy for performing physical activity are also significant factors predicting physical activity in older people [9, 10]. A study of social support examined the role of others in facilitating physical activity, it found that social support could predict physical activity amongst older people [11]. However, even though there are several studies focusing on factors predicting physical activity in older people, there are relatively few studies of physical activity focusing on older people with hypertension [12] in rural area of Indonesia. Inconsistent findings were found regarding the different characteristics and culture of the samples. For instance, research reflecting aspects of older people's physical activity in a theoretical framework is still limited in Bantul, Indonesia. Identifying the factors predicting physical activity within a theoretical framework is a requirement to devise guideline in developing interventions to improve physical activity in older people with hypertension. Therefore, the current study was aimed to identify predictors of physical activity among older people with hypertension in Bantul, Indonesia.

MATERIAL AND METHODS

Design

This is a cross-sectional study.

Sample

Sample size for this study was determined according to Green's rules [13] for multiple regressions. A multi stage sampling technique was carried out to select 174 men and women from 4

Primary Health Centers (PHCs) in Bantul, Indonesia. Participants were selected in geriatric Out-Patient Department (OPD). All participants who were age 60 years and over, diagnosed with hypertension, independent in activity daily living (score of Katz index are 6), and willingly volunteered to participate in this study were included. While, older people suffering from cognitive impairment based on PHC's medical records (score of Short Orientation Memory Concentration Test less than 20) and being hospitalized during the study were excluded.

Research instruments

Data collection was performed by deploying instruments consisting of six questionnaires.

Demographic data survey form

The Demographic Data Survey Form was used to assess personal data that includes, gender, age, educational level, adequacy income, and living arrangement.

Physical activity

Physical activity, a dependent variable, was measured by the Self-reporting of Physical Activity Questionnaire (SPAQ). SPAQ was originally developed by Visuthipanich [14] and determined the total number of hours per week that older people were involved for each activity. SPAQ was modified based on Indonesian culture. Physical activity was measured by energy expenditure per week. The duration of physical activity was calculated by the amount of involvement time which was assigned by a pre-assigned value, whereby: 0-1 hour = 0.5; >1-3 hours =2; > 3-5 hours = 4; >5-7 hours = 6; >7-9 hours = 9; and >9 hours = 10. If duration of involvement is not indicated, the value number was considered as 0. The energy expenditure was calculated by multiplying the total hours of activity performed over the previous seven days by the Metabolic Equivalent value (MET-Hr/wk = Total hr./wk × MET). Higher score indicates better physical activity. The Cronbach's alpha for her instrument was 0.703.

Perceived health status

Perceived health status was participant's feeling about their health condition. A single question "How would you rate your overall health at the present time?" was used to assess the perceived health status. The question had a scale rating of '1' to '4' with '1' indicating poor health and '4' indicating excellent health.

Perceived barrier

The Barriers to Exercise Scale (BES) developed by Melillo et al. [15] was used to assess barriers to

Table 1 Characteristics of older people with hypertension (n=174)

Characteristics	Number	%
Gender		
Male	81	46.6
Female	93	53.4
Age (years)		
60-70	143	82.2
71-80	29	16.7
>80	2	1.1
(Mean=66, SD=5.73, Range 60-85)		
Level of education		
No formal education	28	16.1
Elementary School	59	33.9
Junior High School	27	15.5
Senior High School	47	27.0
Others	13	7.5
Living arrangement		
Alone	10	5.7
Living with family	162	93.2
Living with others	2	1.1
Body Mass Index (BMI)		
Underweight (<18.5)	25	14.4
Normal weight (18.5-24.9)	109	62.6
Overweight (25-29.9)	36	20.7
Obesity (≥30)	4	2.3
(Mean=22.3, SD=3.49, Range=14.61-33.33)		

perform physical activity. Thirteen items of BES was assigned to a Likert scale of 1 to 4; 1= strongly disagree, 2= disagree, 3 = agree, and 4 = strongly agree. The BES score was obtained by summing scores of all 13 items. The higher indicated higher perceived barrier to physical activity. The reliability score of this instrument had a Cronbach's alpha of 0.721.

Perceived self-efficacy

The Perceived Self-Efficacy for Exercise Questionnaire (PSEEQ) developed by Chinuntuya 16] was used to assess perceived self-efficacy to perform physical activity PSEEQ consisted of 12 items with score range from 0 (cannot do) to 10 (certain can do). A total score of perceived self-efficacy for physical activity was computed by summing all items and categorized into 3 levels of perceived self-efficacy (0-40 = low, 41-80 = moderate, and 81-120 = high). The Cronbach's alpha was 0.923

Social support

The Social Support for Exercise Questionnaire (SSEQ) developed by Chinuntuya [16] was adopted in this study to assess social support for physical activity. SSEQ comprised of 11 items including support from family and friends. Family and friends was assessed as two separate entities with scores of 1 (never), 2 (sometime), and 3 (often) except question number 3 (1=often, 2=sometime, 3=never).

The total score for the social support (combined scores of family's support and friends' support) was determined by summing all items. The higher the total score indicated greater social support for older people for performing physical activity. The reliability with Cronbach's alpha was 0.884

Ethical consideration

Approval to conduct the study was granted by Ethics Review Board Committee for Research Involving Human Research Subjects, Boromarajonani College of Nursing Nopparat Vajira (ERB no 35/2014). The consent form was made in two copies and was signed by researcher and volunteering participant to attest mutual understanding and agreement between the participant and the researcher.

Data collection

After approval and permission letter were granted by Ethics Review Board Committee for Research Involving Human Research Subjects, Boromarajonani College of Nursing Nopparat Vajira, activity of public health centers especially in geriatric clinic was followed to meet the participants. The researchers explained the study to potential participants based on an information sheet. One-to-one interview using the structured questionnaires done and this required approximately 40-45 minutes per participant. The weight, height,

Table 2 Self-reported level of physical activity and factors among older people with hypertension (n=174)

Variables	Number	(%)
Physical activity		
Inadequate (MET <100)	77	44.2
Adequate (MET ≥100)	97	55.8
(Mean = 116.10, SD = 58.71, Range=3.75-248.75)		
Perceived health status		
Good	85	48.9
Fair	89	51.1
Perceived barrier		
Low	17	9.8
Moderate	153	87.9
High	4	2.3
(Mean = 32.49, SD = 4.667, Range=16-44)		
Perceived self-efficacy		
Low	46	26.4
Moderate	100	57.5
High	28	16.1
(Mean = 56.71, SD = 23.554, Range=12-120)		
Social support		
Low	156	89.7
High	18	10.3
Mean = 35.89, SD = 7.558, Range= 22-66		

Table 3. The correlation coefficient among independent variables and physical activity in older people with hypertension (n=174)

	1	2	3	4	5	6	7	8
Age[b]		-.192*	-.228**	-.096	.198**	-.198**	-.141	-.284**
BMI[b]			.026	.061	.030	.054	.016	.100
Living arrangement				.116	-.110	.181*	.100	.180*
Perceived health status[c]					-.338**	.048	.179	.101
Perceived barrier[b]						-.266**	-.254**	-.286**
Perceived self-efficacy[b]							.328**	.292**
Social support[b]								.279**
Physical activity[b]								

[a] Point-Biserial; [b] Pearson's product moment correlation coefficient; [c] Spearman's rank
* $p< .05$, **$p<.01$

and blood pressure of participants were measured by the appropriate equipment. The questionnaires were checked and saved in a sealed envelope, after the interview was finished. Data collection was conducted from July 14th until August 30, 2014. A total of 174 questionnaires were obtained.

Data analysis

Data analysis was performed using Statistical Package for the Social Sciences. Descriptive statistics were used to characterize the sample and to examine the distribution properties of the variables. Cronbach's alpha coefficient was used to examine the reliability of the measurement tools. Multiple linear regression was used to examine the effect of independent variables for physical activity.

RESULTS

A total of 174 older people participated in this

study and the mean age was 66 years, Table 1. Activities of daily living of the participants were categorized into independent activity (measured by Katz Index). Percentage of the participants who perform adequate physical activity was higher than the participants who perform inadequate physical activity. About 55.8% of participants engaged in adequate physical activity and more than half of participants perceived their health status as fair (51.1%). Majority of the participants had moderate perceived barrier to physical activity (87.9%). Many participants (57.5%) were classified to have moderate level of self-efficacy for physical activity and 89.7% of the participants had low social support to execute physical activity (Table 2).

The result shows that living arrangement, perceived self-efficacy and social support had a positive relationship with physical activity. Age and

Table 4 Multiple linear regression for predictors of physical activity in older people with hypertension((n=174)

Factors	ß	SE	Beta	t
Age	-1.721*	.779	-.168	-2.208
BMI	.959	1.204	.057	.797
Living arrangement	2.223	4.668	.035	.476
Perceived health status	-2.023	7.121	-.022	-.284
Perceived barrier	-2.009*	1.028	-.160	-1.955
Perceived self-efficacy	.369*	.191	.148	1.933
Social support	1.160*	.600	.149	1.934
R^2= 0.201				

* p< .05

perceived barrier had a negative relationship with physical activity. The strongest relationship was perceived self-efficacy (r =.292, p<.01), followed by perceived barrier, age, perceived social support and living arrangement (Table 3).

This study shows 20.1% variation in physical activity in older people with hypertension in Bantul, Indonesia can be explained by age, BMI, living arrangement, perceived health status, perceived barrier, perceived self-efficacy, and social support (R^2= .201). Age was the strongest predictor of physical activity in older people (B= -.168, p<.05), followed by perceived barrier and social support (B= .160, p<.05; B= .149, p<.05) (Table 4).

DISCUSSION

Participants in this study reported higher average physical activity scores compare to a previous study with 71 participants in urban area of Indonesia [17]. This study suggests that people living in rural areas tend to be more active than urban areas. This finding is similar to study by Kraithaworn [18] who showed that in urban areas, older people had a lower average physical activity scores. This may be due to the history of health problems in older people living in urban areas.

This study has identified important factors that influence physical activity among older people with hypertension in Bantul, Indonesia. The findings revealed that seven factors-age, BMI, living arrangement, perceived health status, perceived barrier, perceived self-efficacy, and social support affected 20.1% of the variance in physical activity among older people with hypertension. However, age, perceived barrier, perceived self-efficacy and social support were the most significant predictors for physical activity.

Amongst all four factors, age has been indicated as the strongest predictor of physical activity when other variables were controlled for. Age had a negative relationship with physical activity and the result indicated that when age increased, level of physical activity would decrease. The decreased

level of physical activity with increasing age was expected, and consistent with findings from previous studies of Poolsawat [8] which had shown that as people get older, they reported less physical activity. Due to ageing, older adults tend to have decreased physical strength, endurance, and flexibility which certainly can impact their ability to perform physical activity. The study conducted by Milanović et al. [19] had found that reduction in physical activity level among the older people was caused by reduced muscle strength, changes in body-fat percentage, flexibility, agility, and endurance. With increased attention to older people, working towards adequate increase of physical activity could be achieved.

Perceived barrier was identified as the second strongest factor predicting physical activity among the older people with hypertension, while perceived barrier had an inverse correlation with physical activity implying that the older people who perceive more barriers to physical activity tended to engage in less physical activity. This finding was congruent with the findings by Patel et al. [9] for perceived barrier affecting physical activity. Based on the findings of perceived barrier in this study, older people's perception about themselves with aches, perception about their health, and feeling of declining physical strength were accounted for most of the barriers to perform physical activity. Perceived barrier to engage themselves in health-enhancing activities could either be realistic or unrealistic, but it would certainly keep the old-aged people from engaging in any activity. Perceived barriers were identified as relevant elements in explaining healthy behavior among the old-aged people [20].

Perceived self-efficacy was another predictor of physical activity among older people. The older people with greater perception of self-efficacy were reported to have a better physical activity score. When the people's own judgment of abilities to accomplish certain physical activity increased, their confidence to perform that physical activity would increase. A study by Laffery [10] stated that people

with more confidence in their own ability to perform certain physical activity reportedly engaged in adequate physical activity and continued to engage themselves in that activity on a regular basis.

Social support could also be a factor predicting level of physical activity. Support given by others influenced older people to accept and engage themselves in health- promoting activities. This is also related to the living arrangement of older people. The increased physical activity in people receiving greater social support was to be expected and was consistent with other studies previously conducted. Study by Lee [12] reported that older people needed family support and support from others to raise their confidence and facilitate engagement in health-promoting activities. Another study by Idowu, et al. [21] described that support from family and friends have a positive stimulus to raise the level of physical activity among older people. This study has suggested that providing physical exercise equipment or facilities was one method to provide social support and meet the needs of older people to promote regular physical activity. Although older people should be encouraged to be independent, support from others ensure that the older people maintained regular and adequate physical activity.

The result of this study was consistent with Pender's Health Promotion Model [20] which stated that the older people's behavior is related to health, especially physical activity was influenced by perceived barriers, perceived self-efficacy, and social support. Pender [20] adopted a multi-dimensional approach towards health promotion. Health promotion involves the individual, family, community, socio-economic, cultural, and environmental dimensions. By considering all these related factors, older people can raise their level of physical activity, maintain health and prevent chronic illness.

Although the objectives have been met in this study, there are some limitations. First, data was collected in Public Health Centers where participants received their treatment and such environmental circumstances might influence the older people's responses to the questionnaire. Secondly, the finding may not be generalized to the older population who did not come to public health centers and since this study was conducted in rural areas, it may not be apt to generalize to the older people with hypertension in urban areas.

CONCLUSION AND RECOMMENDATIONS

This study indicated that adequacy of physical activity still can be reached by a half of older people with hypertension in Bantul. Even tough as age increased, physical activity would decrease and coupled with higher perceived barrier which tended to influence the decrease in physical activity, greater perceived self-efficacy as well as social support would induce higher physical activity. Based on the findings, this study suggests programs to overcome the barriers and improve self-efficacy to raise the level of physical activity among older people. Healthcare providers should provide educational programs to overcome these barriers, including how to prevent aches and pains during physical activity. Last but not the least; healthcare providers should devise peer-support programs to encourage older people with inadequate level of physical activity to promote physical activity for preventing the onset of chronic diseases among the older people in Bantul, Indonesia.

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