ความสัมพันธ์ระหว่างการรับรู้ความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มกับการรับรู้อาการความดันโลหิตต่ำขณะเปลี่ยนท่า การรับรู้ความสามารถในการทรงตัว ประสบการณ์การหกล้ม และยารักษาโรคความดันโลหิตสูงของผู้สูงอายุโรคความดันโลหิตสูงชาวไทย

Associations between Fall Efficacy and Perceived Orthostatic Hypotension, Perceived Balance Ability, Fall Experiences and Antihypertensive Drugs among Thai Older Adults with Hypertension

นิพนธ์ต้นฉบับ

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Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาระดับและปัจจัยที่มีความสัมพันธ์กับการรับรู้ความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มของผู้สูงอายุโรคความดันโลหิตสูง **วิธีการศึกษา:** ผู้สูงอายุที่มารับการรักษาโรคความดันโลหิตสูงที่โรงพยาบาลส่งเสริมสุขภาพตำบลบ้านวังจันทร์ จังหวัดระยอง จำนวน 158 คน ได้มาจากการสุ่มตัวอย่างแบบง่าย เครื่องมือที่ใช้ในการวิจัย ประกอบด้วย ข้อมูลส่วนบุคคล แบบทดสอบความผิดปกติทางการรับรู้ แบบสัมภาษณ์การรับรู้อาการความดันโลหิตต่ำขณะเปลี่ยนท่า แบบสัมภาษณ์การรับรู้ความสามารถในการทรงตัว และแบบสัมภาษณ์การรับรู้ความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มฉบับภาษาไทย (ฉบับปรับปรุง) วิเคราะห์ข้อมูลโดยสถิติเชิงพรรณนา และหาค่าสัมประสิทธิ์สหสัมพันธ์สเปียร์แมน แรงค์ ออเดอร์ **ผลการศึกษา:** กลุ่มตัวอย่างมีการรับรู้ความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มอยู่ในระดับสูง ($\bar{X}$ = 3.51, SD = 0.53) การรับรู้อาการความดันโลหิตต่ำขณะเปลี่ยนท่า การรับรู้ความสามารถในการทรงตัว และประสบการณ์การหกล้ม มีความสัมพันธ์กับการรับรู้ความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มของผู้สูงอายุโรคความดันโลหิตสูง (r_s = -0.464, $p < 0.001$; r_s = 0.462, $p < 0.001$; r_s = -0.169, p = 0.017 ตามลำดับ) ส่วนประเภทของกลุ่มยาที่ใช้รักษาโรคความดันโลหิตสูงมีความสัมพันธ์กับการรับรู้ความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มของผู้สูงอายุโรคความดันโลหิตสูง อย่างไม่มีนัยสำคัญทางสถิติ (r_s = 0.044, p = 0.291) **สรุป:** บุคลากรด้านสุขภาพควรให้ความสำคัญกับผู้สูงอายุที่มีประสบการณ์การหกล้ม มีการรับรู้ความสามารถในการทรงตัวและมีการรับรู้อาการความดันโลหิตต่ำขณะเปลี่ยนท่าที่ไม่ดี โดยสามารถนำผลการวิจัยไปเป็นข้อมูลพื้นฐานในการพัฒนาแนวปฏิบัติการพยาบาลเพื่อส่งเสริมความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มของผู้สูงอายุโรคความดันโลหิตสูง

คำสำคัญ: ปัจจัย, การรับรู้ความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้ม, ความดันโลหิตสูง, ผู้สูงอายุ

Abstract

Objective: To study fall efficacy levels and their associated factors among older adults with hypertension. **Methods:** The sample of 158 older adults with hypertension who visited the Ban Wang Chan subdistrict health promotion hospital in Rayong province was randomly selected by simple random sampling. The research instruments included the demographic questionnaire, the six-item cognitive impairment test [6CIT], the perceived orthostatic hypotension questionnaires, the perceived balance ability questionnaire, and the revised edition of the Thai modified fall efficacy scale (TMFES). The data were analyzed using descriptive statistics and the Spearman rank order coefficient. **Results:** The results revealed that the sample had a high level of fall efficacy ($\bar{X}$ = 3.51, SD = 0.53). Factors associated with fall efficacy among older adults with hypertension at a level of .05 included perceived orthostatic hypotension, perceived balance ability, and fall experiences (r_s = -0.464, $p < 0.001$; r_s = 0.462, $p < 0.001$; r_s = -0.169, p = 0.017 respectively). However, antihypertensive drug groups were not statistically significant in relation to fall efficacy among older adults with hypertension at level of .05 (r_s = 0.044, p = 0.291). **Conclusion:** The findings recommend that healthcare providers should recognize fall efficacy among older adults with hypertension, especially those who have previous fall experiences, impaired perception of balance, and orthostatic hypotension. All health care providers can use this research finding as the basis for developing clinical nursing practice guidelines to promote fall efficacy among this group.

Keywords: factors, fall efficacy, hypertension, older adults

Introduction

Hypertension is a chronic, non-communicable disease that is a global public health problem, including in Thailand. It was found that, in 2022, there were approximately 1.4 billion people with hypertension worldwide,[1] and it is estimated that by the year 2025, there will be an increase in older adults aged 60 years and over with hypertension to 1.56 billion

people.[2] In Thailand, in 2021, 43.90% of older adults were diagnosed with hypertension. In Rayong Province, there were 45.19% of older adults with hypertension and 48.08% in Wang Chan District, Rayong, Thailand.

However, the incidence of hypertension in the older population is due to factors related to the aging process, such as thickening of the artery walls. As a result, the elasticity of the arteries decreases.[3] There is also risk from behavioral factors, including eating salty or high-fat foods, obesity, stress, and a lack of exercise.[4] Hypertension results in serious complications, including heart attack, stroke, kidney failure, and blindness. It is also a leading cause of premature death worldwide.[1] If there is not proper treatment, hypertension will cause an occipital headache, orthostatic or postural hypotension, and dizziness.[4] The impaired balance and mobility that can result increase the risk of falls in the older population more than at other ages. This is consistent with the study that found that older adults with hypertension had a 43% greater history of falls than those without hypertension.[5]

Falling is a serious problem, leading to frequent injuries and deaths among the elderly. In 2019, there were 141,895 older adults injured by falls, representing 29.506% of the older population.[6] External factors causing falls in older adults include polypharmacy and dangerous environments, such as rugs, stairs, and slippery floors. As for internal factors, these include changes with age and chronic illnesses such as diabetes, heart disease, stroke, and hypertension.[7] This is consistent with the study that found that older adults with comorbidities had a 1.86-fold higher risk of falling compared to older adults without comorbidities.[8]

Falling affects older adults physically, psychologically, socially, and economically. On the physical side, they cause injuries ranging from minor to severe, such as bruises, lacerations, or abrasions, through to broken bones.[9] Psychological effects include loss of confidence in walking, social isolation, and depression.[10] In addition to the physical and psychological effects on older adults, there is also a huge impact on the economy. Older adults who are injured may require admission to the hospital and, as a result, incur medical expenses. Some have prolonged hospital stays and may experience complications such as pressure sores, stiff joints, or respiratory tract infections. Every situation that arises will increase the burden. As a result, older adults and their families are stressed and worried about their financial burdens, leading to deaths that are common in older adults.[9] This is the reason why older adults with hypertension feel insecure about performing various activities in their daily life.

Low fall efficacy could be the result, with older adults feeling insecure and in danger. This can lead to them restricting or avoiding activities and limiting their movement,[11,12] such as exercise, thus reducing their ability to control high blood pressure and increasing potentially dangerous complications. It also affects the mind, with them feeling a burden on others, developing depression, and generally interfering with the quality of life and leading to serious illness. This makes it more complicated and difficult to treat, leading to disability and death.[13]

This study was conceptually framed based on the International Classification of Functioning Disability and Health (ICF) of the World Health Organization[14] which was adopted by Pohl[15] to be used as a guideline for grouping factors that may correlate with fall efficacy among older adults with hypertension, together with the application of the theory of self-efficacy.[16] The three components of older adult health relating to fall efficacy are: body functions, defined as perceived orthostatic hypotension and perceived balance ability; personal factors, defined as fall experiences; and environmental factors, defined as antihypertensive drug groups.

Nurses play a role in promoting the health of older adults by encouraging confidence in their daily routine, assisting with their ability to balance, and supporting the management of the environment through safe housing, such as improving home conditions to reduce or prevent accidents. The results of this study can be used as an important basis for planning a nursing practice that is suitable for older adults with hypertension. Such a practice could strengthen confidence in performing daily activities, prevent complications that may arise from restricting activities, reduce dependence, and promote the quality of life of older adults with hypertension.

Methods

The population included older adults aged 60 years and over who had been diagnosed with hypertension, both male and female, and who received services in the hypertension clinic of Ban Wang Chan Subdistrict Health Promoting Hospital, Rayong Province. The sample was selected by

simple random sampling according to the following selection criteria.

To be eligible, they had to be older adults who had to have good consciousness pertaining to time, place, and person as assessed by the Thai version of the six-item cognitive impairment test (6CIT) with a score of 0–7 points indicating no cognitive impairment, be diagnosed with hypertension, have stable signs and symptoms of the disease, have no acute symptoms of the underlying disease, be able to communicate by phone, and receive at least 2 doses of the coronavirus disease 2019 (COVID-19) vaccine. Those who had signs and symptoms of recurrent disease while answering the interview or were unwilling to complete the interview as specified were excluded.

The sample size was estimated based on power analysis using the software program G*power 3.1.9.7.[17] The correlation bivariate normal model was used for calculation. The effect size of 0.221 was based on Piphatvanitcha et al.[18] With a type I error of 5% and a power of 80%, a sample size of 97 participants was required.

Due to the persistent COVID-19 pandemic, the geographical region from which the researcher obtained the data is classified as a high-risk area, Consequently, researchers were required to comply with government measures and regulations to prevent and control the spread of coronavirus disease 2019 (COVID-19).[19] Hence, the data gathering methodology involved conducting telephone interviews with older adults, employing a sample selection technique based on probability sampling by simple random sampling. The process was outlined as follows:

1. The researcher submitted a request for permission to collect data from Burapha University's graduate school to the Director of Ban Wang Chan Subdistrict Health Promoting Hospital.

2. The researcher telephoned to coordinate with the director and staff of Ban Wang Chan Subdistrict Health Promoting Hospital to clarify the objectives and details of the research, asked for permission and cooperation in data collection, and asked for names and phone numbers to contact the older adults with hypertension.

3. The researcher telephoned and coordinated with research assistants who were village health volunteers (VHVs) (15 people) to explain the objectives and details of the research in order to be able to coordinate information, make appointments, and help carry out relevant documents for the sample at home correctly.

4. The researcher conducted the research data collection herself by interviewing the older adults via telephone and following these steps:

4.1 The first phone call was to introduce the researcher, clarify details about the research, and ask for cooperation in screening cognitive disorders among 382 older adults with hypertension. The screening results showed that 24 people had mild cognitive dysfunction and 48 had severe cognitive dysfunction. The researcher informed the older adults or their caregivers of the results of the examination and coordinated with nurses at Ban Wang Chan Subdistrict Health Promoting Hospital so that the older adults could continue to receive appropriate assessment and care.

4.2 The second phone call was to ask for cooperation in conducting research from five older adults who passed simple random sampling by means of random draws per day until the specified number was reached. The researcher explained the details of the objectives, benefits of research, data collection procedure, and the right to participate in, decline, or withdraw from the research. The researcher arranged for a signed or fingerprinted consent form to be brought to the research assistant's home, and the researcher collected data by interviewing via telephone.

4.3 The third phone was called to collect data by telephone interview as scheduled. According to the interview form, four sets are as follows: perceived orthostatic hypotension questionnaires; perceived balance ability; and the revised edition of the Thai modified fall efficacy scale (TMFES). The total time for data collection for each older adult was about 20 minutes.

Research instruments

The first instrument was for screening for eligibility. The Thai version of the six-item cognitive impairment test (6CIT) was used to screen for cognitive function.[21] The original tool was developed by Brooke and Roger Bullock.[22] By back translation, according to Sperber's procedure,[23,24] the comparability of language was 1–2.2 and the similarity of interpretability was 1.2–2.4.[21] The six items (6CIT) were tested on 287 older adults. The 6CIT was significantly negatively correlated with the MMSA (r = -0.91), with a sensitivity of 78.57% and a specificity of 100.00% in screening for dementia.[22] The 6CIT evaluates three cognitive functions,

including perception of the surroundings, intention, and memory. The evaluation criteria were as follows: 0 – 7, 8 – 9, and 10 – 28 points indicated no, mild and severe cognitive impairment, respectively.

The second set of the tool was the personal information questionnaire created by the researcher. The questionnaire was used to collect data about the demographic characteristics of the participants, including age, gender, education level, number of comorbidities, fall experiences, antihypertensive drug groups, and dizziness.

The second part of the questionnaire was the perceived orthostatic hypotension questionnaires were used to assess the perception of the older adults in relation to the symptoms and the severity of hypotension during changes in position. The original tool was developed by Kaufmann et al.[25] and back translated according to Sperber's procedure.[23,24] Orthostatic hypotension questionnaires were tested in 137 Parkinson's disease patients with intraclass correlation coefficients of 0.92.[25] The question was tested for content validity by five experts and had a comparability of language of 2.76 and a similarity of interpretability of 2.68.[20] It was also tested in 30 individuals with characteristics comparable with the participant for the internal consistency reliability was acceptable with a Cronbach's alpha coefficient of 0.83.[20] This instrument consisted of two parts: a symptom perception assessment and a symptom perception assessment of orthostatic hypotension that affects daily activities, totaling 10 items.

This research modified the answer characteristics from the visual analog 10 levels to the Likert scale 1 – 4 points in order to make it convenient for interviewing older adults with hypertension by telephone, as follows. For the assessment of Perceived Symptoms of Orthostatic Hypotension, 1, 2, 3, and 4 points indicated no, mild, moderate, and severe symptoms of orthostatic hypotension, respectively. For the assessment of perceived symptoms of orthostatic hypotension that affect daily activities, 1, 2, 3, and 4 points indicated symptoms of orthostatic hypotension do not, mildly, moderately, and severely interfere with daily activities, respectively.

Interpretation criteria were calculated from the total score by calculating the mean by dividing the total score by the total number of questions answered in the interview form. The full score of the interview form is equal to 4 and is divided into 3 levels according to the range of scores, as 1 – 2, 2.1 – 3, and 3.1 – 4 points indicating the mild, moderate, and severe perceived orthostatic hypotension, respectively.

The third part of the questionnaire was the perceived balance ability was used to assess the opinions of the older adults on their physical ability to balance themselves. The researcher developed this instrument based on the literature review.[26-28] The question was tested for content validity by five experts, specifically three nursing facility members and two specialty nurses. The question was found to have good content validity with an index of item objective congruence (IOC) of 1.[32] It was also tested in 30 individuals with characteristics comparable with the participant for test-retest reliability, repeated measurements 24 hours apart. It was found to have acceptable test-retest reliability (Pearson's correlation coefficient of 0.80). The questions evaluated the older adults' opinions or understandings about maintaining balance. The single question asked the participant to evaluate: "How good is your balance now?" The evaluation criteria are 5, 4, 3, 2, and 1 indicatin that the perceived balance ability was very good, good, fair, bad, and very bad, respectively.

The last part of the questionnaire evaluated the fall efficacy was the revised edition of the Thai modified fall efficacy scale (TMFES) was used to assess the level of confidence in performing daily activities without falling in older adults with hypertension. The original tool was developed by Hill et al.[29] then the work of Piphatvanitcha et al.[18] was translated to the Thai version by back translation according to Sperber's procedure.[23,24] The modified fall efficacy had a comparability of language of 1.79, a similarity of interpretability of 1.63, and Cronbach's alpha coefficient of the general older adults and the older adults with chronic diseases was .92–.98.[18,29-31] The questionnaire with revised edition response scale was tested in 30 individuals with characteristics comparable to the participants. The internal consistency reliability was acceptable with a Cronbach's alpha coefficient of 0.83.[20] This instrument consisted of 14 questions to assess the level of confidence of the older adults in doing daily activities both inside and outside the home, such as getting dressed and undressed, preparing a simple meal, and crossing roads.

This researcher modified the answer characteristics from the visual analogue 10 levels to a Likert scale of 1 – 4 points. The response was a 4-point rating scale ranging from not at all confident, slightly confident, moderately confident, to highly confident, in order to facilitate the telephone interview of older adults with hypertension.

Interpretation criteria were calculated from the total score by calculating the mean by dividing the total score by the total number of questions answered in the instrument. The full score of the instrument is equal to 4 and is divided into 3 levels according to the range of scores as 1 – 2, 2.1 – 3, and 3.1 – 4 points indicating low, moderate an high fall efficacy, respectively.

Ethical considerations

The study was approved by the Ethics Committee for Human Study of Burapha University on October 6, 2021 (approval number: G-HS070/ 2564).

Data collection procedure

The researcher collected data by introducing herself to the participant via telephone, clarifying the objectives of the research, the data collection procedure, and the benefits, along with explaining the protection of the rights of the participants and the need to sign a letter of consent to participate in the research. There were 15 research assistants, that is, village health volunteers, who acted as agents in bringing documents to clarify the study for the research participants. Participants' informed consent documents were sent to the participant subjects at home, and the collected documents were returned to Ban Wang Chan Subdistrict Health Promoting Hospital. It took approximately 20 minutes to collect data per person from October 2021 to March 2022. During the interview, if the older adults or the researcher knew or suspected that the participants had adverse symptoms such as fatigue, headache, dizziness, and shortness of breath, then the researcher coordinated with the village health volunteers. In the preliminary examination of symptoms, according to the researcher's recommendation, in cases where abnormal symptoms were found, the researcher ended the interview and coordinated via telephone with the nurse at Ban Wangchan Subdistrict Hospital to provide immediate and ongoing care.

Data analysis

The personal information and study factors were frequency, percentage, mean, and standard deviation (SD). Accordingly, Pearson Correlation analysis was used for factors related to fall efficacy among older adults with hypertension and found that perceived orthostatic hypotension, perceived balance ability, fall experiences, and antihypertensive drug groups showed abnormal distribution. Therefore, the outlier data was eliminated. It was found that all the data were still not distributed with normal curves. The researcher therefore used Spearman's ranked order correlation coefficient to analyze and convert the obtained data into an ordinal scale according to the preliminary terms of statistics. Statistical significance was set at a type I error of 5%. All statistical analyses were performed using the software program SPSS version 26.

Results

Of the 158 participants, the majority of them were 60 to 69 years of age (62.03%). They were 69.04 (SD = 7.60) years old by average. There were more women (54.43%) than men. The highest education level was elementary school (82.91%), the most common religion was Buddhist (98.10%), their marital status was married (67.72%), and the majority had never smoked (75.95%) and never drunk alcohol (68.35%) (Table 1).

Table 1 Demographic characteristics of the participants (N = 158).

Characteristics	N	%
Gender		
Male	72	45.57
Female	86	54.43
Age (yrs), mean 69.04 ± 7.60		
60–69	98	62.03
70–79	45	28.48
80–89	14	8.86
90 years and over	1	0.63
Educational level		
Not studying	10	6.33
Elementary school	131	82.91
High school	13	8.23
Diploma or equivalent	4	2.53
Religion		
Buddhist	155	98.10
Christian	3	1.90
Marital status		
Single	9	5.70
Married	107	67.72
Separated	9	5.70
Widowed	28	17.72
Divorced	5	3.16
Smoking history		
Never smoke	120	75.95
Used to smoke	38	24.05
Used to but quit smoking	20	12.66
History of drinking		
Never drink alcohol	108	68.35
Used to drink alcohol	50	31.65
Used to but quit drinking	25	15.82

Majority of participants had perceived orthostatic hypotension that was either mild (87.97%) or moderate

(12.03%). In the past one year, 57.59% of the participants had never fallen, while of the participants who had fallen (42.41%), they had fallen once (32.83%) and suffered only minor fall injuries (56.72%). Of the anti-hypertensive medications, the most common taken by participants were the calcium antagonists (68.35%). The drug used by most of the participants was amlodipine (64.56%) (Table 2).

Table 2 Scores and levels of study factors (N = 158).

Factors	N	%
Perceived orthostatic hypotension		
Mild	139	87.97
Moderate	19	12.03
Severe	0	0
Perceived balance ability		
Best	11	6.96
Good		
Fair	89	56.33
Poor	17	10.76
Very poor		
Fall experiences in the past 1 year		
Never fell	91	57.59
Ever fell	67	42.41
Number of falls		
Fall down 1 time	22	32.83
Fall down 2 times	18	26.87
Fall down more than 3 times	9	13.43
Fall down more than 4 times	18	26.87
Fall injuries		
Not injured	20	29.85
Minor injury	38	56.72
Moderate injury	3	4.48
Severe injury	6	8.95
Antihypertensive drug groups (can answer more than 1 group)		
Diuretic group	19	12.02
Beta-blocking drug group	26	16.45
Calcium antagonists	108	68.35
Renin systemic antagonists	82	51.90
Angiotensin receptor antagonists	43	27.21
List of drugs used by the elderly with hypertension		
Amlodipine	102	64.56
Enalapril	82	51.90
Losartan	43	27.22
Atenolol	25	15.82
HCTZ	18	11.39
Nifedipine	3	1.90
Flunarizine	3	1.90
Furosemide	1	0.63
Metoprolol	1	0.63

Majority of participants had high fall efficacy. They had an average score of more than 3 points for every activity. The activities with the highest fall efficacy were light gardening or hanging out the washing (mean = 3.75 ± 0.55 points), walk around the inside of your house (mean = 3.75 ± 0.50 points),

and take a bath or a shower (mean = 3.74 ± 0.54 points). Using front or rear steps at home (mean = 3.25 ± 1.01 points), using public transport (mean = 3.20 ± 1.28 points), and crossing roads (mean = 3.15 ± 1.05 points) had the lowest fall efficacy among the participant (Table 3).

Table 3 Score of each fall efficacy (n = 158).

Activities	Mean	SD
$\bar{x}$ = 3.51, SD = 0.53		
1. Get dressed and undressed	3.49	0.74
2. Prepare a simple meal	3.58	0.65
3. Take a bath or a shower	3.74	0.54
4. Get in/out of a chair	3.32	0.78
5. Get in/out of bed	3.44	0.71
6. Answer the door or telephone	3.49	0.73
7. Walk around the insde of your house	3.75	0.50
8. Reach into cabinets or closet	3.61	0.70
9. Light housekeeping	3.70	0.57
10. Simple shopping	3.69	0.59
11. Using public transport	3.20	1.08
12. Crossing roads	3.15	1.05
13. Light gardening or hanging out the washing	3.75	0.55
14. Using front or rear steps at home	3.25	1.01

Fall efficacy was significantly correlated with each of its associating factors with the expected direction. Fall efficacy was significantly negatively correlated with perceived orthostatic hypotension at a moderate level (r_s = -0.464, p < 0.001). Fall efficacy was significantly positively correlated with perceived balance ability at a moderate level (r_s = 0.462, p < 0.001), negatively correlated with fall experiences at a low level (r_s = -0.169, p = 0.017) and with antihypertensive drug groups there was no statistical significance at the level (r_s = 0.044, p = 0.291) (Table 4).

Table 4 Correlations between fall efficacy and its affecting factors (n = 158).

Factors	Correlation coefficient	p-value
Perceived orthostatic hypotension	-0.464[§] (r_s)	< 0.001
Perceived balance ability	0.462[§] (r_s)	< 0.001
Fall experiences	-0.169[†] (r_s)	0.017
Antihypertensive drug groups	0.044 (r_s)	0.291

[†] P-value < 0.01; [§] P-value < 0.001.
r_s= Spearman's ranked order correlation coefficient.

Discussions and Conclusion

The present study in Thai older adults with hypertension revealed that the majority of the subjects exhibited a high level of fall efficacy ($\bar{x}$ = 3.51, SD = 0.53). The participants had an average score exceeding 3 points for each activity. The study identified three activities that exhibited the highest fall efficacy:

light gardening or hanging out the washing, walking around the inside of your house, and take a bath or a shower. Conversely, the study also revealed three activities with the lowest fall efficacy: using front or rear steps at home, using public transport, and crossing roads. This finding contradicts previous studies conducted on older adults diagnosed with rheumatoid arthritis and chronic obstructive pulmonary disease,[30,31] in which they revealed that the activities associated with the lowest fall efficacy were crossing roads and using public transportation. The potential explanation for this observation could be attributed to the predominant involvement of the study participants in agricultural pursuits, encompassing activities such as plant cultivation, fruit gardening, farming, and animal husbandry. These activities inherently necessitate physical exertion and consistent bodily movements, such as dragging a hose for watering plants, pruning, reaching for harvest, mowing grass, feeding animals, traversing obstacles, and navigating steep slopes. Consequently, the elderly population exhibits physical well-being derived from engaging in agricultural labor, which contributes to the development of robust arm and leg musculature. Moreover, these individuals demonstrate enhanced mobility and balance capabilities. These attributes contribute to a reduced likelihood of experiencing a fall. Furthermore, it is noteworthy that a significant proportion of the study participants (62.03%) fall within the age range of 60 to 69 years, which is commonly considered the early old stage. This demographic characteristic suggests that there may be little physical decline observed among the participants.[33] Older people demonstrate a tendency to view their physical changes as a natural part of the aging process.[34] Consequently, they must adapt their healthcare practices and cultivate self-assurance in order to engage in varied activities, thereby attaining a heightened level of fall efficacy.

The results of this study revealed that the majority of the participants (67.72%) were married. The husband or wife is the person in the family who has the closest relationship with the older adults with hypertension. The spouse is the individual within the familial unit who maintains the most intimate connection with the older adults afflicted with hypertension. The individuals within the family exhibit mutual concern and recognition that the presence of hypertension in one member necessitates adaptations in their respective roles and duties. This is done with the aim of fostering an environment that promotes and motivates other family members to adopt positive health behaviors. This includes encouraging cooperation in solving problems that arise in the family, controlling inappropriate behavior in older adults with hypertension, and helping each other perform their duties properly. Balance the family by acting with flexibility appropriate to the situation or problem that arises.[35] Consequently, older adults with hypertension exhibit a heightened level of fall efficacy. The majority of the participants (82.91%) completed primary education. The educated older adults will have the knowledge and ability to read basic material, so they can recognize danger, resulting in learning and a positive change in self-care behavior. The nature of learning is characterized by experience. When people face any problem or experience, they will try to make use of the wisdom they have accumulated by expressing it as well as seeking knowledge from various sources,[36] such as health personnel. This results in learning to live with the pathology that occurs so they can adjust appropriately by taking medication regularly to treat high blood pressure, which is inconsistent with the study that found older adults with hypertension had a low fall efficacy (68.40%).[37] and older adults with other chronic diseases, including diabetes, rheumatoid arthritis, and chronic obstructive pulmonary disease, had low fall efficacy (53.90%, 73.20%, and 68.90, respectively).[18,30,31]

Perceived orthostatic hypotension is negatively associated with fall efficacy among older adults with hypertension; that is, older adults with mild perceived orthostatic hypotension had high fall efficacy, while older adults with hypertension who perceived severe symptoms of orthostatic hypotension had markedly less fall efficacy, which is according to the assumptions set. It can be explained by the concept of ICF[15], which reports that some drugs for the treatment of hypertension can cause postural hypotension and loss of balance.[40] The perceived symptoms of orthostatic hypotension were influenced by body structure factors, which in turn affected fall efficacy among older adults with hypertension. In this study, it was found that the majority of the participants (87.97%) had a slight perception of orthostatic hypotension. Most were aged in the range of 60 to 69 years (62.03%), which is regarded as the early elderly years. The body changes according to age.[33] The cause of low blood pressure when changing positions in older adults is baroreflex sensitivity, which causes a slow response while changing positions. This causes the heart rate to decrease and the

constriction of blood vessels to decrease, which can thus cause low blood pressure.[38] In older adults with hypertension, there are abnormalities in blood vessels, so the resulting abnormal vasoconstriction and dilatation will make the amount of blood circulating in the body pool in the veins of the legs and abdominal organs (up to about 500 to 1000 ml); the lower amount of venous blood returning to the heart will result in transient hypotension.[39] Older adults may experience dizziness, blurred vision, and fainting, as well as falling when rising from a sitting to a standing position.[41] In addition, the majority of the participants (68.35%) used calcium antagonists, which are drugs that cause low blood pressure when changing positions.[40] However, in the process of taking the drug home, all participants received information on how to take the medication, the possible side effects, and other advice from pharmacists and nurses, enabling them to take care of themselves and respond appropriately when there are side effects from drug use.

This phenomenon can be described in accordance with Bandura's[16] theory of self-efficacy, which can be influenced by various physical factors. The phenomenon of orthostatic hypotension in older adults with hypertension can be conceptualized as a physiological state; being physically fit and in good health will make people have more confidence in their own abilities. If an older adult with hypertension does not recognize perceived orthostatic hypotension, they inevitably have an awareness of their own abilities and believe in their own abilities, thereby demonstrating a high level of fall efficacy. This discovery is consistent with the findings of a study that revealed a negative association between perceived orthostatic hypotension and fall efficacy among older adults with hypertension.[42]

Perceived balance ability was positively associated with fall efficacy among older adults with hypertension; that is, older adults who had high perceived balance ability had high fall efficacy, while older adults with hypertension with lower perceived balance ability had less fall efficacy, which is consistent with the assumptions made. It can be explained by the concept of ICF[15], which states that perceived balance ability is a structural factor affecting fall efficacy among older adults with hypertension. In this study, it was found that the majority of the participants (56.33%) had perceived balance ability at a fair level. This may be due to increasing age. The majority of the participants (62.03%) were in the age range of 60 to 69 years old. The body will begin to deteriorate

according to the age-related changes in the musculoskeletal system:[33] The amount of muscle tissue and the size of the muscle fibers gradually decrease.[43] Such changes affect the strength of the leg muscles, which in turn affects walking posture. Most older adults feel that they are unable to raise their feet as high as they used to. There is a change in the movement of the hips and the load on the leg while walking. This makes it easy for older adults to stumble when walking on rough terrain or at different levels,[33] especially those with hypertension. This is because the major cause of hypertension is arterial stenosis due to the clogging of arteries by fatty plaques. The blood vessels will constrict more, and the lack of flexibility and diminished blood vessel size as a result will increase the total vascular terminal resistance.[33] From the experience of falling in the past year, it was found that, of the 42.41% of participants who had fallen, 32.83% had fallen once, and 56.72% had minor injuries from the aforementioned symptoms. is considered a factor that affects balance in older adults.[44] This is in line with the findings of a Shen[45] study that reported that older adults with hypertension have problems with walking ability and balance. However, most of the sample of participants lived in the community and had careers such as farming rubber plantations and fruit orchards. These can be regarded as providing exercise that helps maintain physical fitness levels, resulting in strong arm and leg muscles that increase the flexibility of movement and make the participants confident in walking and keeping their balance.

This can be explained according to the theory of self-efficacy, Bandura[16], as follows: being physically fit and having a good health condition will make people have more confidence in their own abilities. If the older adults with hypertension had a good level of perceived balance ability. The older adults will have the confidence to walk. believe in one's own abilities. As a result, the fall efficacy was at a high level. This is consistent with the study that found that balance was associated with fall efficacy in older adults with diabetes. rheumatoid arthritis and chronic obstructive pulmonary disease.[18,30,31]

Fall experiences was negatively associated with fall efficacy among older adults with hypertension. That is, older adults with hypertension who had experienced falls had less fall efficacy, and, conversely, older adults with hypertension who did not experience a fall had more fall efficacy, which accords with the assumption. It can be explained by the concept of ICF[15], which states that fall experiences is a

personal factor that affects fall efficacy among older adults with hypertension. From this study, it was found that in the past year, the majority of the participants had never fallen (57.59%), making the participants confident in performing various activities and confident that they could perform that activity safely. Of the participants who had fallen (42.41%), the majority of them fell only once (13.92%). The severity of the injuries from falls among the subjects ranged from no injuries (12.66%) to fractures (3.80%). This is consistent with the study that found that fall experiences were correlated with fall efficacy among older adults with chronic obstructive pulmonary disease, hypertension, and diabetes.[31,37,46] However, it was inconsistent with the study that found that fall experiences were not correlated with fall efficacy among older adults with diabetes and rheumatoid arthritis.[18,30]

Antihypertensive drug groups, this can be explained according to Bandura's[16] theory of self-efficacy, as before: if a person has an abnormal physical condition, this will result in a low level of self-efficacy. They will lack confidence in performing various activities, and so fall efficacy among older adults will be at a low level. The results of this study were inconsistent with studies that found antihypertensive drug groups, especially drugs in the anti-calcium group and angiotensin receptor blockers, caused side effects that could lead to falls. There was a correlation with fall efficacy among older adults with hypertension.[37] This may be because the majority of the participants (68.35% and 51.19%, respectively) used calcium channel blockers and renin system blockers, with less data distribution and not normal curves. As a result, antihypertensive drug groups were not statistically significantly related to fall efficacy among older adults with hypertension[37] at a level of.05.[20]

Our findings could be useful for nurses who are involved in caring for older adults with hypertension, emphasis should be given to the development of guidelines for their care. These should promote confidence in the daily routines of older adults with hypertension, with an emphasis on preventing low blood pressure while changing positions and promoting the ability to keep their balance.

This study created a research instrument and data gathering methodology that aligns with the critical circumstances surrounding the COVID-19 pandemic. The approach involves conducting telephone interviews with elderly individuals. One potential approach to use this study model involves the implementation of diverse communication technologies, such as software programs and various video call apps. Additionally, it entails harnessing the capacity of older adults and their carers, including community volunteers and family members. This will facilitate researchers in effectively engaging with older adults for the purpose of gathering research data, such as conducting comprehensive interviews within real-life contexts.

The study has certain limitation. As a consequence of the highly consequential COVID-19 outbreak, the researcher was unable to go to the data collection area. It was necessary to develop research instruments in the form of interview protocols and assess the perceptions of the older adults in areas such as perceived balance ability instead of conventional methods such as balance tests or direct interpersonal assessments.

This study found that older adults with hypertension had a high level of fall efficacy ($\bar{x}$ = 3.51, SD = 0.53) and the factors related to this were perceived orthostatic hypotension, perceived balance ability, and fall experiences. Antihypertensive drug groups showed no correlation with fall efficacy among older adults with hypertension.

Acknowledgements

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