

ปัจจัยที่สัมพันธ์กับความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มของผู้ป่วยสูงอายุ ที่เข้ารับการรักษาในโรงพยาบาลเอกชนแห่งหนึ่ง

Factors Associated with Fall Efficacy among Older Adult Patients Admitted in A Private Hospital

นิพนธ์ต้นฉบับ

Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาระดับและปัจจัยที่มีความสัมพันธ์กับความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้ม (fall efficacy) ของผู้ป่วยสูงอายุ วิธีการศึกษา: สุ่มตัวอย่างแบบง่ายจำนวน 97 คน จากผู้ป่วยสูงอายุในโรงพยาบาลเอกชนแห่งหนึ่ง รวบรวมข้อมูลโดยใช้แบบสัมภาษณ์ส่วนบุคคล เครื่องวัดความดันโลหิตแบบอัตโนมัติ แบบประเมินความสามารถในการปฏิบัติกิจวัตรประจำวันแบบสัมภาษณ์การรับรู้ความสามารถในการทรงตัว และแบบประเมินความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้ม ทดสอบความสัมพันธ์ด้วยค่าสัมประสิทธิ์สหสัมพันธ์สเปียร์แมนแรงค้อเอเตอร์ (r_s) และค่าสัมประสิทธิ์สหสัมพันธ์พอยท์ไบเอเรียล (r_{pb}) **ผลการศึกษา:** กลุ่มตัวอย่างมีความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มในระดับสูง ร้อยละ 78.35 และสัมพันธ์ทางบวกกับการรับรู้ความสามารถในการทรงตัว และความสามารถในการปฏิบัติกิจวัตรประจำวันในระดับปานกลาง ($r_s = 0.581, P\text{-value} < 0.001, r_s = 0.581, P\text{-value} < 0.001$ ตามลำดับ) และสัมพันธ์ทางลบกับความดันโลหิตต่ำขณะเปลี่ยนท่าระดับปานกลาง ($r_{pb} = -0.328, P\text{-value} < 0.01$) และจำนวนอุปกรณ์การแพทย์ที่ใช้นั้นในระดับต่ำ ($r_s = -0.293, P\text{-value} < 0.01$) สรุป: ผู้ป่วยสูงอายุที่รักษาตัวในโรงพยาบาลเอกชนมีความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้มในระดับสูง และสัมพันธ์ทางบวกกับการรับรู้ความสามารถในการทรงตัวและความสามารถในการทรงตัวและทางลบกับความดันโลหิตต่ำขณะเปลี่ยนท่าและจำนวนอุปกรณ์การแพทย์

คำสำคัญ: ความมั่นใจในการปฏิบัติกิจวัตรประจำวันโดยไม่หกล้ม, ผู้ป่วยสูงอายุ, การรับรู้ความสามารถในการทรงตัว, ความสามารถในการปฏิบัติกิจวัตรประจำวัน

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Abstract

Objective: To determine level of efficacy and its associating factors in older adults hospitalized in a private hospital. **Method:** Older adult patients hospitalized in a private hospital by simple random sampling was recruited (N = 97). Research instruments included demographic questionnaire, automatic blood pressure monitor, the Modified Barthel Activities of Daily Living (ADL) Index, perceived balance ability question, and the Fall-Efficacy Scale. Associations between fall efficacy and its associating factors were based on Spearman ranked order correlation coefficient (r_s) and point-biserial correlation coefficient (r_{pb}). **Results:** Majority of the participants a high level of fall efficacy (78.35%). Fall efficacy was significantly, positively correlated with perceived balance abilities and capability to perform ADL with a moderate level ($r_s = 0.581, P\text{-value} < 0.001, r_s = 0.581, P\text{-value} < 0.001$, respectively), and negatively correlated with orthostatic hypotension with a moderate level ($r_{pb} = -0.328, P\text{-value} < 0.01$) and number of medical devices used with a low level ($r_s = -0.293, P\text{-value} < 0.01$). **Conclusion:** Fall efficacy in older adults hospitalized in a private hospital was at a high level, and positively correlated with perceive balance ability and capability to perform ADL, and negative correlated with orthostatic hypotension and number of medical devices used.

Keywords: fall efficacy, older adult patients, perceived balance ability, activity of daily living

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Introduction

Older adults face deteriorating physiological changes thus more susceptible for illnesses. With deteriorating physical strength, more complicate illnesses, more co-morbidities, and poly-pharmacy, older adults could have less confidence in performing activities of daily living without falling which could lead to a low fall efficacy.¹ Even though low fall efficacy could help older adults from falling by being more careful, previous studies suggest that too low fall efficacy could lead to limited activities of daily living, changes in waling, further drop of fall efficacy, and ultimately more chance of falling.² A study in

Vietnam showed that as high as 88.2% of the elderly patients hospitalized for fall injuries had a low level of fall efficacy.³ In Iran, 36.4% or 1 in 3 older adults hospitalized had a low level of fall efficacy.⁴

A low fall efficacy could limit the activities of daily living which are the obstacles for physical rehabilitation for the older adults. Such limitation could further cause a life-threatening stage of illness. A study revealed that limited mobility and movement affect physical functions.⁵ For example, for central nervous system, the lack of physical stimuli could lead to

sensory abnormalities; for circulatory system, the lack of movement could lead to hypotension because of a decreased in blood volume and an increased in blood viscosity possibly resulting in venous thromboembolism, or pulmonary embolism. For respiratory system, limited movement could result in a decrease in lung and alveolar expansion resulting in shallow breathing, decreased cough reflex, more phlegm, more likelihood of aspiration and pneumonia. For musculoskeletal system, the limited movement could result in bed-ridden ulcers, muscle weakness, muscle dystrophy, sprain, ankylosis, and decreased calcium level which could lead to osteoporosis and fracture. For excretory system, the limited movement allows for urinary gallstone, urinary infection, and constipation. For psychological impacts, the limited movement leads to regressive behavior, anxiety, and loss of confidence which could lead to depression.⁶ For socioeconomic impacts, the limited movement makes the older adult separating themselves from the society, loss of self-care capability, and less self-esteem.⁵ In addition, the limited movement prolongs hospitalization⁷, causes more expenses, and dampens quality of life of the older adults.³

With a concern that fall efficacy leads to various health problems, there is a need for more studies in fall efficacy among the older adults. There has been a limited number of studies about fall efficacy among hospitalized older adults either in Thailand or worldwide. In Thailand, two studies were done in a tertiary hospital⁸ and a community hospital.⁹ There have been no studies in private hospitals which have different contexts regarding physical setting, services, medical equipment and devices, patient characteristics, and service quality.¹⁰ Level of fall efficacy and its affecting factors in older adults hospitalized should be explored more.

Previous research reveals that factors affecting fall efficacy among older adults hospitalized in private hospitals include orthostatic hypotension, capability to perform activities of daily living, perceived balance ability, and numbers of medical devices. The findings could be useful in developing the plan for nursing care appropriate for older adults hospitalized in private hospitals to promote fall efficacy, prevent complications from limited movement, reduce dependence on others, and improve quality of life.

This present study aimed to evaluate fall efficacy level and its affecting factors including orthostatic hypotension, capability to perform activities of daily living, perceived balance ability, and numbers of medical devices among older

adults hospitalized in private hospitals. Accordingly, it was hypothesized that fall efficacy level was associated with orthostatic hypotension, capability to perform activities of daily living, perceived balance ability, and numbers of medical devices among older adults hospitalized in private hospitals.

This study was conceptually framed based on the concept of the International Classification of Functioning, Disability and Health (ICF) of the World Health Organization¹¹ which was adopted by Pohl et al in studying fall efficacy and capability to perform activities of daily living.¹² The four components of older adult health relating to fall efficacy are physical functions/structure factors, physical activities or participation factors, personal factors, and environmental factors. Physical functions/structure factors were defined as physiological and anatomical structures and functions including psychological functions. Orthostatic hypotension is a result of abnormal physical body functions and structures which affects balance and ultimately fall efficacy among older adults.^{11,12}

Physical activities or participation was defined as practice or action of individuals and capability in social participation among hospitalized older adults. These hospitalized older adults were more likely to lose balance from illness and hospitalization which could diminish the capability to perform activities of daily living. They could face obstacles in attending social activities. Difficulties or disabilities in participating social activities could diminish social role and participation.^{11,12}

Personal factors were defined as the background of the persons' life, and how they live their life. These are characteristics that are not health or health status related. With age, older adults have physiological and functional changes or defects. Perceived balance ability is thus decreased and fall efficacy is dampened.^{11,12}

Environmental factors were defined as physical and social environment, and attitudes that the persons exist in and live with. These external factors could influence the person's capability positively or negatively. Hospitalized older adults usually are equipped with medical devices. These devices could limit movement and hence activities. Fall efficacy is usually reduced.^{11,12}

Methods

In this descriptive correlation research, study population was adults aged 60 years or older hospitalized in a private

hospital. Study sample was 97 individuals in the study population hospitalized between February to April 2022.

The participants were selected using simple random sampling. To be eligible, participants had to be able to communicate in Thai language, be hospitalized at least 24 hours before participation, have no signs or symptoms of acute illnesses such as acute stroke, Covid-19 infection, or being treated in semi-critical unit or critical unit. They also had to have a good consciousness pertaining to time-place-person as assessed by the Thai version six-item Cognitive Impairment Test (6-CIT) with the score of 0 – 7 points indicating no cognitive impairment.

The sample size was estimated based on power analysis using the software program G*Power 3.1.9.7.¹³ The correlation bivariate normal model was used for calculation. The effect size of 0.25 was based on a previous study revealing that perceived health status was positively correlated with fall efficacy in older adults hospitalized in a tertiary hospital in the eastern Thailand.⁸ With a type I error of 5%, a power of 80%, a sample size 97 participants was required.

Research instruments

The first instrument was for screening for eligibility. The Thai version six-item Cognitive Impairment Test (6 CIT) was used to screen for cognitive function. The original tool was developed by Brooke and Roger Bullock¹⁴ by modifying the 26-Item Blessed Information –Memory–Concentration Scale to only six items. The six items (6-CIT) were tested in 287 older adults compared with the Mini Mental State Examination (MMSE) as the benchmark. The 6-CIT was significantly, negatively correlated with MMSE ($r = -0.91$) with a sensitivity of 78.57% and a specificity of 100.00% in screening for dementia.¹⁴ The 6-CIT was translated into Thai language with a good validity of translation both language equivalence and interpretation equivalence with indices of 1.00 – 3.00 for all items.^{15,16} The 6-CIT evaluates three cognitive functions including perception on the surroundings, intention, and memory. The total score for all the three functions combined are 0 – 28 points with 0 – 7 points indicating no cognitive impairment.

The second set of the tool was the self-administered 5-part questionnaire. The questionnaire collected data of demographic characteristics of the participants including age, gender, and the number of medical devices used.

The second part of the questionnaire evaluated the fall efficacy. The researcher modified a Thai language scale called the Fear of Falling scale¹⁷ which was modified and back-translated from the Fall-Efficacy Scale (FES) of Tinetti et al.¹⁸ The FES contained 10 questions asking about the confidence in performing 10 activities of daily living without falling. The response was a visual analog scale ranging from 1-the highest confidence to perform the activity without falling to 10-the lowest confidence to perform the activity without falling.¹⁸ In this present study, the researcher modified the response to a 4-point Likert-type rating scale ranging from 1-not at all confident, to 2-slightly confident, 3-moderately confident, and 4-highly confident. With the total score of 10 – 40 points, fall efficacy was categorized as low and high (less than 70% and 70% or higher of the total score, respectively). The questionnaire with modified 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 0.88.

The instrument to evaluate orthostatic hypotension was an automatic blood pressure monitor device (Dinamap, GE Healthcare). Supine blood pressure was measured first. Standing blood pressure was measured 1 and 3 minutes after standing. If the systolic blood pressure (SBP) dropped at least 20 mmHg and/or the diastolic blood pressure (DBP) dropped at least 10 mmHg within 3 minutes after changing from supine for standing, the participant experienced orthostatic hypotension.^{19,20} Validity of this blood pressure measurement device was calibrated by a certified medical device engineer and against the NIBP Simulator Fluke Prosim 8 for reliability. In addition, an inter-rater reliability was tested by two raters, i.e., the researcher (SS) and a registered nurse with 10-year experience in 10 individuals with characteristics comparable to the participants. The tool to detect orthostatic hypotension was found to have a good inter-rater reliability with kappa statistics of 1.00.

The fourth part of the questionnaire was the Modified Barthel Activities of Daily Index (BAI) to evaluate the capability to perform activities of daily living in the last 24 – 48 hours of the older adults. The scale was originally developed by Mahoney and Barthel.²¹ It was tested in evaluating the capability of the Thai older adults by Jitapunkul et al.²² It was used to test the disability of 703 older adults in Klongtoey slum in Bangkok and the internal consistency reliability was acceptable with a Cronbach's alpha coefficient of 0.79.²³ The

scale contains 10 items with the response of a rating scale ranging from 0-being unable to do the activity and need help, to 1-being able to do the activity with help, and 2-being able to do the activity with no help needed. Since internal consistency reliability was tested²³, it was not tested in this present study. With the total of 21 points, capability to do the activities was categorized as totally, mostly, partly, and lightly dependent on others (0 – 4, 5 – 8, 9 – 12, and more than 12 points, respectively).

The last part was the question on perceived balance ability developed by the researcher. The questions evaluated the older adults' opinion or understanding about maintaining balance while being interviewed. The single question asked the participant to evaluate "how good is your balance now?"²⁴⁻²⁶ The response was a 5-point rating scale ranging from very bad, bad, fair, good, and very good. The question was tested for content validity by five experts, specifically three nursing faculty members and two specialty nurses. The question was found to have a good content validity with an index of item objective congruence (IOC) of 0.8. It was also tested in 30 individuals with characteristics comparable with the participant for test-retest reliability, i.e., two repeated measurements at 9.00 AM, and 5.00 PM. It was found to have an acceptable test-retest reliability (Spearman's correlation coefficient of 0.88).

Participant ethical protection

The study was approved by the Ethics Committee for Human Study of Burapha University (approval number: G-HS071/2564) and by the Ethics Committee for Human Study of the private hospital (approval number: IRB 2021-11-29). The permission to conduct the study was also granted by the director of the private hospital.

Data collection procedure

With the Covid-19 pandemic, the researcher approached the participants with strict caution for the whole data collection period. Once permission to conduct survey was granted, the researcher approached the participants to provide objectives, procedure, and voluntary nature of the study. The participants were informed that they could step participation at any time with no consequences on the care they received. Once the informed consent form was signed, the interview was started. The orthostatic hypotension was determined. The researcher read to and filled the questionnaire for the participant.

Data analysis

Demographic characteristics and study factors were presented with mean with standard deviation (SD) and frequency with percentage. Accordingly, it was hypothesized that fall efficacy level was associated with orthostatic hypotension, capability to perform activities of daily living, perceived balance ability, and numbers of medical devices among older adults hospitalized in private hospitals. The correlations between fall efficacy and its associating factors were tested. Data of all relevant variables were not normally distributed. Therefore, Spearman's ranked order correlation (r_s) analysis was used for fall efficacy and perceived balance ability, capability to perform activities of daily living, and the number of devices used. Point biserial correlation (r_{pb}) analysis was used for fall efficacy and orthostatic hypotension. 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 97 participants, majority of them were in their 60 – 69 years of age (69.07%) (Table 1). They were 67.49 (SD = 6.04) years old by average. There were more women (65.98%) than men. The majority had no co-morbidity (75.27%). The most used medical devices was volumetric infusion pump (81.58%).

Table 1 Demographic characteristics and clinical status of the participants (N = 97).

Characteristics	N	%
Gender		
Men	33	34.02
Women	64	65.98
Age (years), mean = 67.49 ± 6.04		
60 - 69	67	69.07
70 - 79	27	27.83
≥ 80	3	3.10
Co-morbidity		
No	73	75.27
Mild co-morbidity	11	11.34
Moderate co-morbidity	3	3.09
Severe co-morbidity	10	10.30
Medical devices used		
Volumetric infusion pump	93	81.58
Oxygen supply	7	6.14
Foley's catheter	9	7.89
Nasogastric tube	5	4.39

Majority of participants had perceived balance ability at a fair level (45.36%) and a good level (40.21%). Most

participants had a low level of dependence on others (97.94%) and had no orthostatic hypotension (94.85%) (Table 2). About three-quarters had only one medical devices (76.29%) with a mean of 1.16 devices per person.

Table 2 Scores and levels of study factors (N = 97).

Factors	N	%
Fall efficacy		
High	76	78.35
Low	21	21.65
Perceived balance ability		
Poor	5	5.15
Fair	44	45.36
Good	39	40.21
Best	9	9.28
Capability to perform activities of daily living		
Partial dependence on others	2	2.06
Low dependence on others	95	97.94
Orthostatic hypotension		
No	92	94.85
Yes	5	5.15
Number of medical devices used, mean = 1.16 ± 0.49 devices.		
None	4	4.12
One device	74	76.29
2 – 3 devices	19	19.59

Majority of the participants had fall efficacy at a high level (78.35%) while the rest 21.65% had a low level (Table 2). For specific activities, the activity rated for fall efficacy the most was preparing meals not requiring carrying heavy or hot objects (mean = 3.60 ± 0.61 points), followed by personal grooming e.g., wash your face (mean = 3.58 ± 0.72 points), and getting in and out of bed (mean = 3.34 ± 0.81 points) (Table 3). On the other hand, activities rated for fall efficacy the least was reaching into cabinets or closets (mean = 2.76 ± 1.11 points), taking a bath or shower (mean = 3.15 ± 0.82 points), and walking around the patient room (mean = 3.23 ± 0.85 points) (Table 3).

Table 3 Score of each fall efficacy (N = 97).

Activities	Mean*	SD
Take a bath or shower	3.15	0.82
Reach into cabinets or closets	2.76	1.11
Walk around the patient room	3.23	0.85
Prepare meals not requiring carrying heavy or hot objects	3.60	0.61
Get in and out of bed	3.34	0.81
Answer the door or telephone	3.30	0.86
Get in and out of a chair	3.25	0.87
Getting dressed and undressed	3.26	0.95
Personal grooming (e.g., wash your face)	3.58	0.72
Get on and off the toilet	3.29	0.76

* Possible mean score of 4 points.

Fall efficacy was significantly correlated with each of its associating factors with the expected direction. Fall efficacy

was significantly, positively correlated with perceived balance ability and capability to perform activities of daily living at a moderate level ($r_s = 0.581$, P -value < 0.001, for both) (Table 4). On the other hand, fall efficacy was significantly, negatively correlated with orthostatic hypotension and the number of medical devices used at a low level ($r_{pb} = -0.328$, P -value < 0.01; $r_s = -0.293$, P -value < 0.01, respectively).

Table 4 Correlations between fall efficacy and its affecting factors (N = 97).

Factors	Correlation coefficient	P-value
Perceived balance ability	0.581 [§] (r_s)	< 0.001
Capability to perform activities of daily living	0.581 [§] (r_s)	< 0.001
Orthostatic hypotension	-0.328 [†] (r_{pb})	0.001
Number of medical devices used	-0.293 [†] (r_s)	0.002

† P -value < 0.01; § P -value < 0.001.

r_s = Spearman's ranked order correlation coefficient.

r_{pb} = Point biserial correlation coefficient.

Discussions and Conclusion

The present study in Thai older adults hospitalized in a private hospital revealed that fall efficacy was at high level by 78.35% of the participants. Activities rated the most capable were preparing meals not requiring carrying heavy or hot objects, personal grooming e.g., wash your face, and getting in and out of bed (mean = 3.60, 3.58, and 3.34 points, respectively). This high level of fall efficacy could be because the facilities offered by the tertiary-level private hospital. In the private room for each individual patient, there was a bathroom with handrail bar, handrail bar around the room wall, electric power-lift bed, automatic lighting, electronic nurse call, and safety measures. These facilities could have helped them feel more capable than usual. In addition, most participants were in their early elderly with a mean age of 67 years and with no comorbidity (75.27%) and low dependence on others regarding capability to perform activities of daily living (97.94%). This relatively good health could have contributed to a high level of fall efficacy.

The high fall efficacy could be partly explained by the ICF concept¹¹ applied in the work of Pohl et al¹² that older adults hospitalized are usually in their early elderly. They had illnesses with low severity which allows them to perform activities of daily living and maintain their social role. With mild co-morbidity, most patients needed few medications and medical devices. Thus, their capability to perform activities of

daily living could be maintained. The elderly perceived their capability and health status at a high level.²⁷ Hence, a high level of fall efficacy.

Activities with the least perceived as capable were reaching into cabinets or closets, taking a bath or shower, and walking around the patient room (mean = 2.76, 3.15, and 3.23 points, respectively). This could be because their illness caused gait imbalance, decreased strength, and deteriorated physiological function. When hospitalized, the older adults took more medications and used more medical devices. It has been reported that 35% of individuals aged 60 years or older have difficulty balancing and increased to 50% when reaching 80 years or older.¹ In addition, there is a decrease in muscle strength and flexibility of joints and tendons which lead to a decrease in the coordination of muscle and joints, and ultimately a limited movement.² With all changes, these activities relating to movements were lessened and their fall efficacy was rated as low.

Fall efficacy was found to significantly, positively correlated with perceived balance ability ($r_s = 0.581$, P -value < 0.001). Hospitalized elderly with good perceived balance ability had high fall efficacy, and vice versa. The finding was consistent with the ICF concept where perceived balance ability could enhance fall efficacy.^{11,12} In this study, most participants had perceived balance ability at a moderate level (45.36%) and good level (40.12%) and had no orthostatic hypotension (94.85%). With no or little limited movement in performing activities, the elderly could perceive their capability as high²⁷; hence a high perceived balance ability. Our finding is consistent with studies in the elderly in a medical center⁸ and a community hospital⁹ revealing that the elderly with defective balance had significantly low fall efficacy.

It was found that fall efficacy was significantly, positively correlated with capability to perform activities of daily living at a moderate level ($r_s = 0.581$, P -value < 0.001). The elderly with high fall efficacy had higher capability to perform activities of daily living, and vice versa. Based on the ICF concept^{11,12}, activities of daily living is a activity and participation factor. Hospitalized elderly lost their balance from long-hour laying and the body could not perform with the full capacity because of their illness and treatment. As a result, the elderly has limited activities which further reduce their capability to perform activities and their daily living.^{3,28} In our study, most older adults were in their early elderly age with a mean age of 67 years, had low dependence on others (97.94%). They

could perform adequate self-care. With the facilities and caregivers provided by the private hospital, the patients could have felt highly supported. All-time nurse call service could also allow for less worry about rapid help. Facilities and helps could allow the elderly perform activities with less limitation. Being able to perform activities of daily living would allow the elderly to perceive more self-efficacy²⁷ which could further enhance more fall efficacy. Our finding is consistent with studies in medical center⁸ and in community hospital⁹ revealing that the elderly with high capability to perform activities of daily living had a significant high fall efficacy.

Orthostatic hypotension was significantly, negatively correlated with fall efficacy at a moderate level ($r_{pb} = -0.328$, P -value = 0.001). The elderly with no orthostatic hypotension had fall efficacy, and vice versa. Older persons with experience of orthostatic hypotension would have less fall efficacy. The response of autonomic nervous system and circulatory system toward movement has been declining with age. Hence, the elderly are more likely to face orthostatic hypotension.²⁹ Hospitalized older adults had been limited in their movement and mobility in the bed. Once getting up, they usually faced dizziness, fainting, or comatose since blood was inadequately circulating to the brain. Individuals experiencing orthostatic hypotension could have less fall efficacy. Polypharmacy could also cause orthostatic hypotension. Various medications with central nervous system could cause dizziness, drowsiness, and imbalance.¹ These symptoms could also lead to less fall efficacy among the elderly. In this present study, 94.85% of the older adults had no orthostatic hypotension which could be associated with a high level of fall efficacy.²⁷ It is consistent with a study in Turkey where orthostatic hypotension was significantly associated with fall efficacy in the elderly.³⁰

The number of medical devices used was significantly, negatively correlated with fall efficacy with a low level ($r_s = -0.293$, P -value = 0.002). The more devices used, the less fall efficacy, and vice versa. Based on the ICF concept^{11,12}, medical devices are an environmental factor which could influence self-efficacy positively or negatively. Hospitalized older adults need various medical devices such as volumetric infusion pump, venous catheter, and urinary catheter. In addition, private hospitals provide much more appliances and devices to prevent human errors by their healthcare workers. These devices could considerably limit movement of the older adults and interfere performing the activities of daily living.

Therefore, fall efficacy could be perceived as low.²⁷ In our study, most older adults used at least one device (76.29%) of which volumetric infusion pump was used by most of them (81.58%). In this private hospital, the intravenous infusion pump was on the moveable 360-degree rotation pole which allowed the patients move almost freely. The patients were also accompanied with family members all the time which could allow for less anxiety or worry when performing activities of daily living. A study in a medical center also revealed that the number of medical devices used was significantly, negatively associated with fall efficacy in the elderly.⁸

Our findings could be useful for developing protocols of programs to promote fall efficacy in older adults hospitalized in private hospital. Healthcare providers could be informed about the need to enhance the elderly patients on physical activities and exercise. Slow movement to prevent orthostatic hypotension should be emphasized so that providers could remind themselves to advise the patients. With more physical activities and movements, the number of medical devices should be reduced so that the patient could further gain more fall efficacy.

The study had certain limitation. With the social distancing during the Covid-19 pandemic, the evaluation of balance ability was done with the single question perceived balance ability instead of actual physical examination on balancing. Future studies should strive to measure balance by the actual examination. The older adults hospitalized during the Covid-19 pandemic seemed to be healthier than usual. Before the pandemic, there were more bed-ridden patients. Therefore, the level of fall efficacy and capability to perform activities of daily living could have been higher than usual. Future studies when the pandemic is over should be conducted.

In conclusion, fall efficacy among older adults hospitalized in a private hospital was at a high level, and was positively associated with perceived balance ability and capability to perform activities of daily living, and negatively associated with orthostatic hypotension and the number of medical devices.

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