KPC Kinesiology and Physiotherapy Comprehensive

P-ISSN: 2830-6317
E-ISSN: 2962-5491

Hypertension and falls in the elderly: a literature review

Kadek Andre Yasa[1,*], Anak Agung Gede Angga Puspa Negara[2], I Dewa Gede Alit Kamayoga[2]

[1]Bachelor and Professional Program of Physical Therapy, College of Medicine, Universitas Udayana, Bali, Indonesia;
[2]Departement of Physiotherapy, Faculty of Medicine, Universitas Udayana, Bali, Indonesia;

ABSTRACT

Background: Falling is a condition when a part of the body comes into contact with the ground or floor. The incidence of falls in the elderly is approximately 30-50%.. Hypertension is an intrinsic factor in the occurrence of falls because it affects the body's awareness and balance. Therefore, the authors reviewed the articles to find out the relationship between hypertension and the incidence of falls in the elderly. This study aimed to determine the relationship between hypertension and the incidence of falls in the elderly.

Methods: This study used a literature review design to discuss the hypertension and falls in the elderly. Journals were obtained by accessing the Google Scholar and PubMed databases using the keywords elderly, hypertension, falls. Search for journals based on inclusion criteria which includes: year of publication of the article in the last 10 years, journal articles in the open access category and full text articles. Exclusion criteria include: if there are articles that are the same, then other articles will be executed, abstracts, theses, and theses.

Results: Based on the four reviewed journals, it was found that history of hypertension affects the incidence of falls in the elderly. The highest incidence of falls is experienced by the elderly in the old or old category, namely aged 75-90 years and the most dominant is experienced by the elderly who are female.

Conclusion: There was a possible relationship between hypertension and the incidence of falls in the elderly. Further study may find the correlation and risk factors of the hypertension to the falls incidence among elderly.

Keywords: body, elderly, fall, hypertension

Received: January 5, 2024. **Accepted**: March 5, 2024.
Type: Review article; **DOI:** 10.62004/kpc.v3i1.35

***Corresponding author:** Kadek Andre Yasa, Bachelor and Professional Program of Physical Therapy, College of Medicine, Universitas Udayana; Email: kadekandreyasa62@gmail.com

Introduction

Aging is a process experienced by every human being with a gradual decline in the ability of the body's tissues to maintain and improve its normal functions.[1] According to the Indonesian Ministry of Health, an elderly person is someone who is 60 years or older. The elderly are grouped into 5, namely qualified elderly, healthy elderly, independent elderly, active elderly and productive elderly.[2] Based on WHO, elderly can be classified into several groups, namely, middle age, namely elderly aged 45-59 years, elderly or elderly, namely seniors aged 60-74 years, elderly or old, namely seniors aged 75-90 years, and very old or very old, namely seniors aged > 90 years.[3] Physical changes experienced by the elderly in a degenerative manner will have an impact on health and affects the activities of the elderly, such as decreased heart function, hypertension, hypotension, and musculoskeletal complaints which can increase the risk of falls.[4] The aging process experienced by the elderly can also result in a decrease in musculoskeletal function which has an impact on increasing the risk of falls.[5]

The prevalence of falls in the elderly is 30-50%. In 2014 As many as 28.7% of the elderly reported experiencing a fall at least once during the previous 12 months, so that falls were experienced by 29.0 million elderly people.[6] Elderly people over 65 years of age are recorded to be at risk of falling 30% and elderly people aged 80 years were recorded at 50%.[7] The incidence of falls in the elderly caused by extrinsic and intrinsic factors. Extrinsic factors include environment, activities, and medications. Meanwhile, intrinsic factors include disturbances sensory system, dementia, central nervous system, metabolic disorders, style disorders walking and cardiovascular system disorders. One of the diseases caused by system disorders cardiovascular is hypertension.[8]

Hypertension is a condition where blood pressure is at a high level, namely systolic pressure of more than 140 mmHg and diastolic pressure of 90 mmHg or more. Based on data from the Indonesian Ministry of Health, the incidence of hypertension in Indonesia is 34.1% and especially in the Bali area is 30%. Hypertension or often known as high blood pressure is a condition where blood circulation experiences a chronic increase. This happens because the heart works faster to pump blood which will be circulated throughout the body to meet oxygen and nutritional needs.[9] Hypertension

P-ISSN: 2830-6317
E-ISSN: 2962-5491

and aging are related to vasoconstriction and decreased cardio acceleration which is mediated by impaired salt conservation, renal water, baroreflexes, and slow heart filling. An acute orthostatic decrease in blood pressure in hypertensive sufferers can result in transient cerebral ischemia resulting in reduced blood flow to the brain and can exacerbate chronic decreases in blood flow to the brain.[10] Hypertension can disrupt perfusion to body tissues including the brain which acts as the center for controlling consciousness and balance. Decreased perfusion ability and oxygen levels to brain tissue will result in an imbalance in the body, resulting in a risk of falls. Chronic hypertension that does not receive treatment can result in damaged blood vessels in the heart, causing blood circulation to the heart muscle to be hampered. This can trigger heart attacks and increase the incidence of falls.[11] Studies by Andrews et al. stated that one of the causes of elderly people falling is hypertension.[12] This is in line with research by Wijayanti et al. which states that there is a significant positive relationship between hypertension and falls in the elderly.[13]

Based on the description above, the aim to be achieved from this literature review study is to find out how hypertension is related to the incidence of falls in the elderly. Previous research has proven this relationship, but here the author will add to the age range and gender of the elderly who have the highest incidence of falls.

Methods

Journal articles were obtained through the PubMed and Google Scholar databases with the keywords of "elderly", "hypertension", and "falls". The inclusion criteria used were year of publication of the article in the last 10 years, journal articles in the open access category and full text articles. Meanwhile, the exclusion criteria: if there is the same article, then another article will be executed, abstract and thesis. Inclusion and exclusion criteria were set independently by the authors. This study found 15 journal articles with the full text, then filtered by the author and obtained four main journal articles. Data was extracted by summarizing grouped data in tables which include journal authors, year, research methods, samples, measuring instruments and research results.

Results

The results of the journal search yielded four journals used within the last eight years, indicating that all the journals show Hypertension and falls in the elderly. Based on Rauwelio et al. (2021) showed that most falls occur in elderly people aged 75 years and over. Of the 21 cases of falls, nine cases of falls were influenced by the elderly's history of hypertension.

Based on Maneeprom et al. (2018) showed that most (62.5%) participants who experienced a fall had a history of hypertension. As many as (81.3%) fell due to consuming drugs, namely seductives, hypnotics, seizures, and antihypertensives. Based on Thi Ha et al. (2021) showed that Participants with alcohol consumption, comorbidities (hypertension, COPD, having three or more comorbidities), geriatric syndrome (urinary incontinence, weakness, fear of falling, limited ADL/IADL), walking speed, and poor results on the TUG test indicate that there is a relationship significantly related to falls. Based on Araújo et al. (2016) showed that the results of clinical variables show that hypertension is the most common disease that influences falls in the elderly

Discussion

Falling is a situation where the body loses balance to maintain a position. This loss of balance occurs suddenly, whether consciously or unconsciously. Many elderly people experience decreased balance, especially those with a history of hypertension. The incidence of falls can be influenced by a history of hypertension and also environmental influences. A fall in the elderly is an accident that can result in physical disability and even death.[14]

Based on four studies that the author used as a literature review, the four studies stated that hypertension influences the incidence of falls in the elderly. In research conducted by Rauwelio et al. Regarding the number of falls in the elderly at Sanglah General Hospital in 2018 which used a cross-sectional research method and the number of samples was 21 with an age range of 62-90 years. This research states that falls are more prevalent among elderly women (76.2%) than men (23.8%). The incidence of falls based on age was found to predominantly occur in elderly people aged 75 years and over with nine cases. Further data is based on medical records, a history of elderly disease, namely hypertension, influences the incidence of falls in nine cases (43.9%).[15] This is supported by research by Chu et al. states that elderly people who have a history of hypertension are associated with an increased risk of falls.[16]

Research by Maneeprom et al. about falls in elderly people in nursing homes, Bangkok using a cross-sectional study and a sample size of 64 elderly people aged 60-75 years. Researchers stated that most of the samples were women (81.2%) and men (18.8%) where the majority had a history of hypertension. In addition, it was found that the use of drugs such as hypnotics, antihypertensives, seductives, and seizers influenced the incidence of falls (81.3%). In this study, it was found that the main factors in falls were due to tripping and loss of balance, this was associated with the health characteristics of elderly people who had a history of hypertension (n = 40), diabetes mellitus (n = 15), osteoarthritis (n = 15), heart disease (n =8), incontinence (n=8), and stroke (n= 4). Based on the data presented by researchers, 33 elderly women had experienced falls and 19 elderly women had no experience of falling. A total of 8 elderly men had experienced falls and four elderly had no experience of falling. In the age range 60-75 there were falls experienced by 21 elderly people and 10 did not experience falls, while at the age of 76 years there were falls experienced by 20 elderly people and 13 elderly people did not experience falls.[17]

KPC Kinesiology and Physiotherapy Comprehensive

P-ISSN: 2830-6317
E-ISSN: 2962-5491

Table 1. The results of literature search of the correlation between the Hypertension and falls in the elderly

Authors	Methods and samples	Measuring instrument	Results
Rauwelio et al. (2021)	Method: *Cross sectional* Sample (n): 21 with 62-90 years old	Medical records	Most falls occur in elderly people aged 75 years and over. Of the 21 cases of falls, 9 cases of falls were influenced by the elderly's history of hypertension
Maneeprom et al. (2018)	Method: *Cross sectional* Sample (n): 64 with 60-75 years old	Interview, TUG, BBS	Most (62.5%) participants who experienced a fall had a history of hypertension As many as (81.3%) fell due to consuming drugs, namely seductives, hypnotics, seizures, and antihypertensives
Thi Ha et al. (2021)	Method: *Cross sectional* Sample (n) 539 with 60-80 years old	Interview, GDS, PSQI, TUG	Participants with alcohol consumption, comorbidities (hypertension, COPD, having three or more comorbidities), geriatric syndrome (urinary incontinence, weakness, fear of falling, limited ADL/IADL), walking speed, and poor results on the TUG test indicate that there is a relationship significantly related to falls.
Araújo et al. (2016)	Method: Deskriptive study Sample (n): 80 with 60-79 years old	Interview	The results of clinical variables show that hypertension is the most common disease that influences falls in the elderly

TUG, Timed Up and Go; BBS, Berg Balance Scale; GDS, Geriatric Depression Scale; PSQI, Pittsburgh Sleep Quality Index

Other research that supports this is research from Thi Ha et al. related to the prevalence and factors associated with falls in elderly patients who are outpatients. This research used a cross-sectional study with a sample size of 539 elderly people aged 60-80 years. Researchers stated that 128 (23.7%) of the elderly sample reported having experienced a fall at least once a year in the previous period. It is said that the incidents reported were mostly experienced by elderly men (n=73) and elderly women (n=55). Found in samples with alcohol consumption, comorbidities (hypertension, COPD, having three or more comorbidities), geriatric syndrome (urinary incontinence, weakness, fear of falling, limited ADL/IADL), walking speed, and poor results on the TUG test indicate that there is significant relationship with the incidence of falls.[18]

Based on research conducted by Araújo et al. discusses the incidence of falls in the elderly using a descriptive study method on 80 elderly aged 60-79 years. The sample consisted of 65 women and 15 men with an age range ranging from 60-69 years as many as 41 people, 70-79 years as many as 35 people, and 80 years and over as many as four people. Researchers stated that 73.8% of the sample had experienced falls, 72.9% had experienced falls up to three times, and 27.1% had experienced four or more falls. The results of clinical variables show that hypertension is the most common disease that influences falls in the elderly (30.8%), followed by osteoporosis (20.3%), and arthrosis (13.7%).[19] This statement is supported by Bakar's research. et al. which states that there is a high prevalence of falls in elderly people with a history of hypertension.[20] The weakness of this literature review study is that the author did not explain more specifically regarding the duration of the history of hypertension experienced by elderly people. It is hoped that future research will explain the duration of the history of hypertension in every elderly person who experiences a fall.

The limitations of this study were not explained regarding the intervention to treat the problem, so there is a possibility of bias, and it cannot be generalized to all subjects. Future studies can explain the specifics of the intervention to treat the problem in subjects and the relationship between hypertension and the incidence of falls in the elderly with quality of life.

Conclusion

P-ISSN: 2830-6317
E-ISSN: 2962-5491

Based on the four articles that have been collected and also the discussion that has been described, it could be concluded that a history of hypertension influences the incidence of falls in the elderly. The highest incidence of fall was experienced by elderly with category of aged 75-90 years and female. This research provides an overview to the public regarding the influence of hypertension which may cause falls in the elderly. Thus, it is important for the elderly to maintain their normal blood pressure to avoid falls.

Author Contribution

KAY conceived the study design and data collection and drafted the manuscript; AAGAPN and IDGAK collected the data and revised the manuscript.

Funding

This study was not funded by any grant source.

Conflict of interest

The author states there is no potential conflict of interest in connection with the research, authorship and or publication of this article.

Ethical consideration

This review study used published articles that are accessible. Thus, this study did not require any informed or ethical consideration.

References

1. Azizah AN, dan Maryoto M. Studi kasus asuhan keperawatan lansia dengan hipertensi di ppslu dewanata cilacap. J Inov Penelit. 2022;3(4): 9–12.
2. Kemenkes RI. Peraturan menteri kesehatan republik indonesia nomor 25 tahun 2016 tentang rencana aksi nasional kesehatan lanjut usia. Kemenkes RI. 2016;2(1)20-26.
3. Dewi NP. Gambaran perilaku pasien diabetes melitus pada lansia di desa baler bale agung kecamatan negara kabupaten jembrana. Poltekkes Denpasar. 2021;4(2):20-25.
4. Rohima V, Rusdi I, Karota E. Faktor resiko jatuh pada lansia di unit pelayanan primer puskesmas medan johor. J Persat Perawat Nas Indones. 2020;4(2):108.
5. Pradnyanini IAM, Adhitya IPGS, Muliarta I M. Lansia kurang aktif memiliki risiko jatuh lebih tinggi dibandingkan lansia aktif di denpasar barat. Majalah Ilmiah Fisioterapi Indonesia. 2016;7(1), 45-49.
6. Yuliati P, Rochmah N, Ayu I, Susanto A, Maryoto M, Program M. Hubungan durasi kejadian hipertensi dengan resiko jatuh lansia. J Keperawatan Notokusumo (JKN. 2021;9(2):58–61.
7. Farda HF, Putri N, Novotasari D. Asuhan keperawatan risiko jatuh pada lansia usia 66 tahun dengan hipertensi di puskesmas baturraden 1. SNPPKM. 2021;2(1) 890-893
8. Rudi A, dan Setyanto RB. Analisis faktor yang mempengaruhi risiko jatuh pada lansia. J Ilm Ilmu Kesehat Wawasan Kesehat. 2019;5(2):162–6.
9. Arum YTG. Hipertensi pada penduduk usia produktif (15-64 tahun). Higeia J Public Heal Res Dev. 2019;1(3):84–94.
10. Ganggavati MD, Hajjar MS, Quach MPH. Hypertension, orthostatic hypotension, and the risk of falls in a community-dwelling elderly population: the maintenance of balance, independent living, intellect, and zest in the elderly of boston study. NIH Public Access. 2011; 59(3): 210-300.
11. Hana E, dan Kirana V. Hubungan Antara Lama Hipertensi Dan Gambaran. J Ilm Ilmu Kesehat Wawasan Kesehat.2018;7(2):51–65.
12. Andrews NJ, Waight PA, George RC. Impact and effectiveness of 23-valent pneumococcal polysaccharide vaccine against invasive pneumococcal disease in the elderly in England and Wales. Vaccine. 2012;30(48):68–80.
13. Wijayanti A, Werdati S, Khodriyati NS. Hubungan hipertensi dengan resiko jatuh pada lansia puskesmas kasihan ii bantul. Univ Alma Ata Yogyakarta. 2019;3(2) 10-13.
14. Elsa N, and Kuswardhani TR. Hubungan obat antihipertensi dengan jatuh pada populasi lanjut usia di beberapa klinik di kota denpasar tahun 2015. E-Jurnal Medika. 2018;7(7)20-25.
15. Rauwelio M, Yuliana NP, Wardana S. Prevalensi kejadian jatuh pada lansia di rsup sanglah pada tahun 2018. Jurnal Medika Udayana. 2021;10 (1): 65-70
16. Chu JJ, Chen XJ, Shen SS. A poor performance in comprehensive geriatric assessment is associated with increased fall risk in elders with hypertension: A cross-sectional study. J Geriatr Cardiol. 2015;12(2):113–208.
17. Maneeprom A, Taneepanichskul SM, Panza PG. Falls among physically active elderly in senior housings, Bangkok, Thailand: situations and perceptions. Clinical Interventions in Aging. 2018; 13(2): 2149-2159.
18. Thi H, Nguyen X. Prevalence and factors associated with falls among older outpatients. Environmental Research and Public Health. 2021;18(2):40-51.
19. Araújo S, Martins F. Concern with falls in elderly people attended in an integral attention center. Rev. Eletr. 2016;18(2):20-25.
20. Bakar AAZA, Kadir AA, Idris D. Lansia dengan hipertensi: prevalensi jatuh dan faktor terkaitnya. International Journal of Environmental Research and Public Health. 2021;18(16): 82-97.
21. Warmadewi NKU, Adhitya IPGS,Griadhi IPA, Sutadarma IWG. Hubungan indeks massa tubuh dan lingkar perut terhadap foot hyperpronation pada perempuan dewasa di desa batuan, sukawati, gianyar. Majalah Ilmiah Fisioterapi Indonesia.2018; 3(1):36-40.
22. Nugraha IGMN, Winaya IMN, Negara AAGAPN, Andayani NLN. The relationship between leg muscle strength and functional mobility in the elderly. Physical Therapy Journal of Indonesia. 2024;5(1):25-28.