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Polyclinic of General Hospital Level II Udayana Denpasar

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“Gambaran Keseimbangan Postural Lansia Diabetes Mellitus di Poliklinik Geriatri Rumah Sakit Tk II Udayana Denpasar”

Peneliti Utama : Triyana Puspa Dewi, S.Kep., Ns., M.Kep
Institusi : Stikes Kesdam IX/Udayana
Tempat Penelitian : Rumah Sakit Tk II Udayana Denpasar

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Balance defined as the individual ability to maintain the center of body gravity within the limits of the base of support, refers to postural stability and control (1). The impairment of balance is caused by multiple factors depending on the structures affected and other underlying diseases (2). The negative impacts of postural balance impairment are the possibility of falling and decreasing mobility (2,3). It is important to measure postural balance, specifically lateral stability, because it may be influenced by high levels of fear of falling (4). National Institute of Aging stated that if the balance impairment is getting undetectable and chronic, it is a consequence of disruptions of relationships, declining work performance, and lowering the ability to carry out daily activities (5).

The elderly (upper 60 found as the highest prevalence victims due to falls globally. In America, 20 to 30% of elders who fall experience moderate to severe injuries, such as bruises, hip fractures, or head trauma, with the level of seriousness based on advanced age, loss of balance, and more common in women (6). The previous study found that the elders with type 2 diabetes mellitus have a 59% possibility to fall higher than nondiabetic elders. Linked to insulin use, the likelihood of falls among insulin users is 162 higher compared to those without insulin (7). Based on time to reach stability, the age after 60 needs 17% longer compared with the under (8). The research that compared the postural balance due to gender found that male elders have better stability than females when tested by opening and closing their eyes on hard or soft areas to step (9). In the research that compared active older adults, inactive older adults, and younger adults, the center of pressure sway and velocity of older adults was greater than that of younger adults. It is reflected that older adults tend to be physically inactive and present a high risk of falling due to balance impairment (10). The study to measure anticipatory postural adjustment based on age found that older adults were unable to adjust their postural responses. It is indicated that the elderly faced the problem in transition for the change from standing to walking (11).

Losing balance in the elderly induces faintness, nausea, or unsteadiness. The following symptoms, like spinning when standing, dizziness without explanation, or feeling like

floating, may persist after 50 years old. In elders with diabetes, low blood sugar may contribute to dizziness and sudden anxiety (12). The balance problem in the elderly with diabetes mellitus may be caused by several factors, such as neuropathy related to diabetes, degradation of sensory and motor skills ability, and cognitive problems (13). The review about age-related balance and gait impairment reveals that the elderly have a dependency on vision to maintain posture that increases the risk of falls (14). It may increase gradually due to advanced age, specifically in overweight and obese elderly compared to the elderly with a normal body mass index. Overweight, obesity, and underweight were related to a higher proportion of dynamic balance impairments (15). The exercise to increase the capability of elders to maintain balance and prevent falls needs to be performed routinely. A lifestyle such as healthy food consumption, exercise, sleep, and good rest may ensure the elders stay active in their old age (16). The research in Indonesia proved that balance exercise for institutionalized elderly with a risk of falling is able to improve the postural balance after evaluation using the Berg Balance Scale (17). The activities for older adults that help them to maintain their body's strength and stability are tai chi, yoga, one-foot standing, heel-to-toe walking, balance walking, sideways walking, and other changing-position training. By combining three types of physical activities as a combination of aerobic, muscle strengthening, and balance as weekly activities (18).

The study performed in General Hospital Level II Udayana Denpasar which never performed the balance function specifically in diabetes mellitus elders. This study aims to identify the demographic characteristics and postural balance in elderly with diabetes mellitus. The balance of elderly measure by using the Berg Balance Scale as the effort to screen the balance impairment specifically in diabetes mellitus elderly.

meTHOD

This study uses a quantitative research method with a cross-sectional approach to determine the postural balance in elderly patients with diabetes mellitus. The research was

conducted in March 2025 at the Geriatric Polyclinic of Udayana Hospital Tk II with the sampling technique was purposive sampling. The population in this study consists of 156 respondents, calculated based on the average number of outpatients over the past 3 months. The sample calculation found 94 people who were involved in this study based on the inclusion and exclusion criteria. The inclusion criteria in this study are being at least 60 years old, having diabetes for at least 1 year, being able to read and write, and being willing to be a respondent. The exclusion criteria are not routinely undergoing examinations and inadequate health conditions such as blind. The postural balance was assessed by using the Berg Balance Scale. During performing the step of balance measurement, three nurse are guarding the patient on the right and left sides as well as the back, while the researcher is at the front of the chair where the patient holds on when moving. All participants involved in this study have voluntarily signed the informed consent after receiving a proper explanation of the research. This research has been deemed ethically acceptable by the Health Assessment Ethics Committee of Stikes Kesdam IX/Udayana with the number: 06/EC-KEPK-SK/II/2025.

RESULT

The result was conducted at Udayana Level 2 Hospital Denpasar as a military hospital and the highest referral hospital within the Kodam IX/Udayana area. This hospital is located at Jalan P.B Sudirman No.1, Dauh Puri, Denpasar Barat, Kota Denpasar. The main facilities provided include inpatient care, outpatient care, treatment rooms, a pharmacy, and other adequate support services to deliver professional care, accompanied by a fairly comfortable waiting area. Elderly patients with diabetes mellitus receive professional care from Internist and polyclinic nurses. The respondents in this study numbered 94 out of a total of 112 samples based on the sample calculation formula. The excluded respondents were 8 people with severe vision impairment, 4 people diagnosed with diabetes for less than 1 year, 6 individuals who were first-time patients referred to the geriatric polyclinic at Udayana Level 2 Hospital Denpasar.

The demographic data of the respondents show that the majority are aged 60-74, with 68 people (72.34%), 54 men (57.45%), 38 people (40.42%) with a high school education and 62 people (64.04%) having diabetes for more than 5 years, as shown in Table 1.

Table 1. The Demographic Distribution of Ederly with Diabetes Mellitus in Geriatric Polyclinic of General Hospital Level II Udayana Denpasar

Categories	Frequencies (f)	Percentage (%)
------------	-----------------	----------------

Age		
-----	--	--

60-74		
-------	--	--

75-90		
-------	--	--

68		
----	--	--

26		
----	--	--

72,34		
-------	--	--

27,66		
-------	--	--

Sex		
-----	--	--

Male		
------	--	--

Female		
--------	--	--

54		
----	--	--

40		
----	--	--

57,45		
-------	--	--

42,55		
-------	--	--

Level of education		
--------------------	--	--

None		
------	--	--

Elementary		
------------	--	--

Junior high school		
--------------------	--	--

Senior high school		
--------------------	--	--

University		
------------	--	--

4		
---	--	--

12		
----	--	--

30

38

10

4,26

12,76

31,91

40,42

10,65

Duration of diabetes

1-5 years

>5 years

32

62

34,04

65,96

Table 1 reveals that 68 respondents (72.34%) were between 60-74 years old, 54 respondents (57,45%) were male, 38 respondents (40.42%) were high school graduated, and 62 respondents (65.69%) were experienced diabetes more than 5 years.

Table 2. Distribusi frekuensi keseimbangan postural lansia diabetes mellitus di Poliklinik Geriatri RS TK II Udayana

Categories	Frequencies (f)	Percentage (%)
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1 (wheelchair bound)	2	2,13
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2 (walking with assistance)	32	34,04
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3 (independent)	60	63,83
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Total	94	100,00
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Tabel 2 reveals that 60 respondents (63,83%) were independent, while 32 respondents were walking with assistance (34,04%).

DISCUSSION

According to the research's findings, the elderly are predominantly 60-74 years old, which is in line with the report from the Endocrine Society that those 65 or older are more at risk of developing diabetes mellitus. Most of them experienced complications such as hypoglycemia, kidney failure, and heart disease more than the younger (19). The retrospective study found that one of five elderly (≥ 65 years old) people have diabetes mellitus, and it is higher among overweight participants. Male respondents in the current study found a greater percentage of diabetes mellitus. In the United States, male and older adults also found a higher prevalence of type 2 diabetes mellitus (20). Based on the level of education, the respondents are predominantly in senior high school. The previous study found that the average years of study was 8 years. The participants with low levels of education may have low access to information and find it difficult to follow the recommended treatments (21). According to the duration of being diagnosed, this study found the respondents have more than 5 years of experience as patients of diabetes mellitus. The study in Indonesia found that almost all of the respondents with diabetes mellitus ≥ 5 years had peripheral neuropathy (77.4% of 31 respondents) that may impact the balance and stability (22). Therefore, the American Diabetes Association recommends assessing for neuropathy on the first day of diagnosis of diabetes mellitus type 2 and after 5 years for type 1. It may benefit as early detection for the risk of imbalance (23).

The current study reveals that elderly respondents with diabetes mellitus, based on postural balance measurement, are elderly who are dependent and require assistance to walk using aids. During the assessment, the movements that respondents found difficult included standing on one leg and alternating placing their feet on a bench, while the movements that all respondents were generally able to perform well included sitting to standing and standing without support. The category of walking with assistance is

experienced by respondents who need help walking and climbing stairs, using canes, walkers, or crutches, or holding onto handrails installed in the room. Respondents in the independent category are generally able to perform daily activities independently, but aspects of balance such as climbing stairs and standing on one leg still require assistance. After conducting a more detailed data collection regarding demographic data and health history, several supporting factors for the condition were found, including that the respondents were predominantly female, over 70 years old, had a history of recurrent falls in the past year, had very minimal physical activity, and had a more frequent history of pain-relief medication use. Some of these conditions greatly affect the elderly's ability to achieve good postural balance. The results of this study indicate that diabetes and postural imbalance conditions are very likely to occur in the elderly, accompanied by various other risk factors due to aging.

In elderly individuals with diabetic neuropathy, there is a possibility of experiencing postural and gait instability. Neuropathy conditions will impact daily activities as they increase the risk of falls (24). The latest research in 2024 compared the balance among diabetic and non-diabetic persons in the group. It is found individuals with diabetes without neuropathy had shorter tandem on unstable surfaces and worse anticipatory postural adjustments and reactive postural responses than individuals without diabetes (25). It is also in line with the research in China that compared the postural static among different age groups. It was suggested that the individuals with diabetes mellitus and older age had worse static postural balance. The poorer balance function was found to correlate to advanced age. It may happen due to the worsened function of the visual, somatosensory, and central nervous system levels (26). The previous study in community-dwelling older adults that linked diabetes mellitus with gait and falls found that vision and cognition were mediators of DM and gait speed impairment. It is a consequence of balance problems and increasing risk of falling (27).

CONCLUSION

Elderly with diabetes mellitus potentially experienced postural imbalance categorized by walking assisted. By assessing the postural balance as early detection in elder with diabetes mellitus, it is beneficially as the fall prevention among elders.

RECOMMENDATION

The result of postural balance measurement is the basic data for the other research to develop programs for fall prevention or improve balance that may be performed independently.

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