National Journal of Multidisciplinary Research and Development
www.multinationaljournal.com
ISSN: 2455-9040
Received: 17-02-2026, Accepted: 19-03-2026, Published: 03-04-2026
Volume 11, Issue 2, 2026, Page No. 17-20

Implementing orthostatic vital assessment to reduce early postoperative falls: An evidence-based practice initiative in medical-surgical units

Santoshini Jena[1], Dr. Nelson Jewas[2]
[1] Research Scholar, Department of Medical Surgical Nursing, Mansarovar Global University, Sehore, Madhya Pradesh, India
[2] Research Guide, Department of Medical Surgical Nursing, Mansarovar Global University, Sehore, Madhya Pradesh, India

Abstract

Background: Postoperative falls are a major patient safety concern in medical-surgical units, often associated with undetected orthostatic hypotension. Early identification and prevention strategies are essential to reduce fall-related complications.

Objective: To evaluate the effectiveness of implementing orthostatic vital sign (OVS) assessment in reducing early postoperative falls in medical-surgical units.

Methods: A quantitative quasi-experimental pre–post intervention study was conducted among 750 postoperative patients in a tertiary care hospital. Participants were divided into pre-intervention (n=375) and post-intervention (n=375) groups. A standardized OVS assessment protocol was implemented prior to ambulation in the post-intervention phase. Data were collected using structured tools and analyzed using descriptive statistics, chi-square test, and logistic regression analysis.

Results: Orthostatic hypotension was identified in 38% of patients in the post-intervention group. The incidence of postoperative falls significantly decreased from 7.5% in the pre-intervention group to 1.3% in the post-intervention group ($p < 0.001$). Logistic regression analysis revealed that orthostatic hypotension (OR = 3.8, $p < 0.001$) and advanced age were significant predictors of falls. Compliance with the OVS protocol was high (96%).

Conclusion: The implementation of OVS assessment significantly reduced early postoperative falls. Incorporating this evidence-based intervention into routine nursing practice can enhance patient safety and improve clinical outcomes in medical-surgical settings.

Keywords: postoperative falls, Orthostatic hypotension, Orthostatic vital signs, Patient safety, Fall prevention, Medical-surgical nursing, Nursing intervention, Risk assessment.

Introduction

Patient falls are a major concern in healthcare settings, particularly in medical-surgical units where postoperative patients are at increased risk due to physiological instability and reduced mobility. Falls can lead to serious complications such as fractures, prolonged hospitalization, increased healthcare costs, and even mortality. According to the National Health Service, falls are one of the most common adverse events in hospitalized patients and represent a significant burden on healthcare systems [1]. Similarly, Public Health England emphasizes that fall prevention is a critical component of patient safety and quality care initiatives [2].

One of the key contributing factors to early postoperative falls is orthostatic hypotension (OH), a condition characterized by a significant drop in blood pressure upon standing. OH can lead to dizziness, syncope, and impaired balance, thereby increasing the likelihood of falls. Clinical guidelines developed by the European Federation of Neurological Societies highlight the importance of early identification and management of orthostatic hypotension to prevent adverse outcomes [3]. Studies have also shown that OH is particularly prevalent among older adults and hospitalized patients, making it a critical factor to consider in postoperative care [4, 5].

Evidence from systematic reviews indicates a strong association between orthostatic hypotension and falls, especially in vulnerable populations [6]. Additionally, epidemiological data suggest that falls not only impact patient health but also impose a significant economic burden on healthcare systems [7]. Despite this, orthostatic vital sign (OVS) assessment is often not routinely performed before ambulation in postoperative patients, leading to missed opportunities for early detection and prevention of fall-related risks.

Guidelines from the National Institute for Health and Care Excellence recommend comprehensive risk assessment and preventive strategies for falls, including monitoring physiological parameters such as blood pressure changes [9]. However, in real-world clinical practice, gaps remain in the consistent implementation of these recommendations, particularly in busy medical-surgical settings. Recent studies utilizing electronic health records have also highlighted underreporting and inadequate documentation of orthostatic hypotension in clinical practice [8].

Review of Literature

Orthostatic hypotension (OH) has been widely recognized as a significant and often underdiagnosed contributor to falls, particularly among older and hospitalized patients. A study by Claffey et al. [11] reported that even asymptomatic orthostatic hypotension is strongly associated with an increased risk of falls, highlighting the importance of routine assessment even in the absence of symptoms. This finding is particularly relevant in postoperative settings, where patients may not report dizziness despite physiological instability.

Large-scale audit data from the Royal College of Physicians [12] further emphasize that falls remain a persistent issue in healthcare systems, with many cases linked to inadequate

assessment and preventive strategies. These findings underline the necessity for structured and standardized clinical protocols, especially in high-risk environments such as medical-surgical units.

Several intervention-based studies have explored strategies to reduce fall risk. Exercise-based interventions have shown significant effectiveness in improving strength, balance, and mobility, thereby reducing fall incidence among older adults [13, 15]. Additionally, nutritional interventions such as vitamin D and calcium supplementation have demonstrated a moderate reduction in fall risk, particularly in populations with deficiencies [14]. While these approaches are valuable, they are primarily long-term preventive strategies and may not address the immediate risk of falls in acute postoperative settings.

Rehabilitation-focused interventions have also been studied for their role in restoring functional independence following falls. Foote et al. [16] highlighted the importance of targeted therapy in improving autonomy and functional outcomes in elderly patients after traumatic falls. Similarly, recommendations from the U.S. Preventive Services Task Force [17] advocate multifactorial interventions, including physical activity and clinical assessments, to reduce fall risk. However, these guidelines mainly focus on community-dwelling populations rather than hospitalized patients.

Environmental factors also play a crucial role in fall prevention. Systematic reviews and meta-analyses have shown that modifications such as improved lighting, reduced clutter, and assistive devices can significantly decrease fall risk [18, 19]. Furthermore, Stevens et al. [20] emphasized that the circumstances surrounding falls, including environmental hazards and patient-specific vulnerabilities, must be carefully evaluated to implement effective preventive measures.

Despite the availability of multiple preventive strategies, a critical gap remains in early, point-of-care physiological assessment, particularly in postoperative patients. Most existing interventions focus on long-term prevention or community settings, with limited emphasis on acute care protocols such as orthostatic vital sign (OVS) assessment prior to ambulation. Given the strong association between orthostatic hypotension and falls, integrating OVS assessment into routine nursing practice could provide a simple, cost-effective, and evidence-based approach to identifying high-risk patients and preventing early postoperative falls.

Materials and Methods

1. Study Design

A quantitative, quasi-experimental pre–post intervention study design was employed to evaluate the effectiveness of implementing orthostatic vital sign (OVS) assessment in reducing early postoperative falls in medical-surgical units. This design was selected to assess changes in outcomes before and after the implementation of a structured, evidence-based nursing intervention in a real-world clinical setting.

2. Study Setting

The study was conducted in the medical-surgical units of a tertiary care hospital, where adult postoperative patients receive routine monitoring and nursing care.

3. Study Population and Sample Size

The study population consisted of adult postoperative patients aged 18 years and above. A total sample size of 750 patients was included in the study, with participants recruited using a consecutive convenience sampling technique. All eligible patients admitted during the study period were included to minimize selection bias. The sample size was determined based on feasibility and to ensure adequate statistical power to detect a significant reduction in postoperative fall incidence at a 5% level of significance.

4. Inclusion and Exclusion Criteria

Patients aged 18 years and above, within 24 hours post-surgery, and clinically stable for ambulation were included in the study. Patients admitted to intensive care units, those with hemodynamic instability, cognitive impairment, or mobility limitations unrelated to surgery were excluded to maintain homogeneity of the study population.

5. Study Duration

The study was conducted over a period of eight weeks and was divided into two phases: pre-intervention and post-intervention.

6. Intervention Protocol

During the pre-intervention phase, baseline data on routine nursing practices and the incidence of postoperative falls within 24 hours were collected. In the intervention phase, a standardized orthostatic vital sign assessment protocol was implemented prior to the first ambulation.

The protocol involved measuring blood pressure and heart rate in three positions: supine, sitting (after 1–3 minutes), and standing (within 3 minutes). Orthostatic hypotension was defined as a decrease in systolic blood pressure of ≥20 mmHg or diastolic blood pressure of ≥10 mmHg upon standing. A fall was defined as an unintentional descent to the floor with or without injury.

Patients identified with orthostatic hypotension received targeted fall-prevention interventions, including patient education on requesting assistance, use of bed alarms, assisted ambulation, and close nursing supervision.

7. Data Collection Tools and Procedure

Data were collected using a structured observation checklist, patient demographic and clinical data form, and fall incident reporting records. The tools were reviewed by clinical experts to establish content validity, and a pilot study was conducted to ensure feasibility and reliability.

Data collection was carried out in two phases. Baseline data were recorded during the pre-intervention phase, followed by implementation of the intervention and subsequent data collection in the post-intervention phase.

8. Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics such as mean, standard deviation, frequency, and percentage were used to summarize the data. Inferential statistics, including the chi-square test, were applied to compare fall incidence between pre- and post-intervention groups. Multivariate logistic regression analysis was performed to identify predictors of postoperative falls while controlling for potential confounding variables. A p-value of less than 0.05 was considered statistically significant.

Results and Discussion

1. Participant Characteristics

A total of 750 postoperative patients were included in the study, with 375 patients in the pre-intervention group and 375 patients in the post-intervention group. The demographic and clinical characteristics of the participants were comparable between the two groups, with no statistically significant differences ($p > 0.05$), indicating baseline homogeneity.

Table 1: Demographic and Clinical Characteristics of Participants (N = 750)

Variable	Pre-Intervention (n=375)	Post-Intervention (n=375)	p-value
Age (Mean ± SD)	56.8 ± 12.4	57.2 ± 11.9	0.68
Male (%)	58%	60%	0.57
Female (%)	42%	40%	—
Type of Surgery (Major)	62%	64%	0.61
Type of Surgery (Minor)	38%	36%	—
Comorbidities (%)	48%	50%	0.63

Note: No significant differences confirm group comparability.

2. Prevalence of Orthostatic Hypotension

In the post-intervention group, orthostatic vital signs (OVS) were assessed in all patients. Among them, 285 patients (38%) were identified with orthostatic hypotension, while 465 patients (62%) had normal readings.

Table 2: Prevalence of Orthostatic Hypotension (Post-Intervention, n=375)

Category	Frequency	Percentage
Orthostatic Hypotension Present	142	38%
Normal OVS	233	62%

3. Incidence of Postoperative Falls

The incidence of postoperative falls within 24 hours was significantly reduced following the implementation of the OVS assessment protocol. In the pre-intervention group, 28 falls (7.5%) were recorded, whereas in the post-intervention group, only 5 falls (1.3%) occurred.

Table 3: Comparison of Postoperative Falls (Pre vs Post Intervention)

Group	Falls (n)	Percentage	p-value
Pre-Intervention (n=375)	28	7.5%	
Post-Intervention (n=375)	5	1.3%	< 0.001

Note: Statistically significant reduction in falls after intervention

4. Compliance with OVS Protocol

The compliance rate for OVS assessment in the post-intervention phase was 96%, indicating high adherence among nursing staff after structured training.

Table 4: Compliance with OVS Assessment Protocol

Parameter	Frequency	Percentage
OVS Completed	360	96%
OVS Not Completed	15	4%

5. Predictors of Postoperative Falls

Multivariate logistic regression analysis identified orthostatic hypotension and advanced age (>65 years) as significant predictors of postoperative falls.

Table 5: Logistic Regression Analysis of Fall Predictors

Variable	Odds Ratio (OR)	95% CI	p-value
Orthostatic Hypotension	3.8	1.9–7.2	<0.001
Age > 65 years	2.4	1.2–4.8	0.01
Comorbidities	1.5	0.8–2.9	0.12

Discussion

The present study evaluated the effectiveness of implementing orthostatic vital sign (OVS) assessment in reducing early postoperative falls in medical-surgical units. The findings demonstrated a significant reduction in fall incidence from 7.5% in the pre-intervention phase to 1.3% in the post-intervention phase ($p < 0.001$), indicating the effectiveness of the intervention. This supports the growing emphasis on evidence-based nursing practices in enhancing patient safety outcomes.

A key finding of this study was the high prevalence of orthostatic hypotension (38%) among postoperative patients, which is consistent with previous research indicating that orthostatic hypotension is common in hospitalized and older populations [5, 6]. The identification of orthostatic hypotension as a significant predictor of falls (OR = 3.8, $p < 0.001$) further reinforces its critical role in postoperative patient safety. Similar findings have been reported in earlier studies, where orthostatic hypotension was strongly associated with increased fall risk, even in asymptomatic individuals [11].

The substantial reduction in falls observed in this study can be attributed to the early identification of high-risk patients through OVS assessment, followed by targeted fall-prevention interventions such as assisted ambulation, patient education, and close monitoring. These findings are consistent with recommendations from the National Institute for Health and Care Excellence [9], which emphasize the importance of systematic risk assessment and preventive strategies in reducing fall incidence.

In addition to physiological factors, previous literature has highlighted the role of multifactorial interventions, including exercise, environmental modifications, and rehabilitation strategies, in fall prevention [13, 18]. However, most of these interventions are focused on long-term or community settings. In contrast, the present study addresses a critical gap by focusing on acute postoperative care, where immediate risk assessment and intervention are essential.

The high compliance rate (96%) observed in this study reflects the effectiveness of structured training and protocol standardization among nursing staff. This highlights the importance of implementation strategies in ensuring adherence to clinical guidelines and improving patient outcomes. Similar findings have been reported in quality improvement initiatives, where staff education and standardized protocols significantly enhanced clinical practice.

Despite its strengths, this study has certain limitations. The quasi-experimental design without randomization may introduce potential confounding factors. Additionally, the study was conducted in a single center, which may limit generalizability. Future research should consider multi-center randomized controlled trials and explore long-term sustainability of the intervention.

Conclusion

The implementation of a standardized orthostatic vital sign assessment protocol prior to ambulation was associated with a significant reduction in early postoperative falls in medical-surgical units. The study highlights the importance of early detection of orthostatic hypotension and the role of targeted nursing interventions in improving patient safety. Integrating OVS assessment into routine postoperative care can serve as a simple, cost-effective, and evidence-based strategy to prevent falls and enhance clinical outcomes.

References

1. National Health Service. Falls: Overview. National Health Service Website, 2021. Available from: https://www.nhs.uk/conditions/falls/ (Accessed February 12, 2025).
2. Public Health England. Falls: Applying All Our Health. UK Government Website, 2019. Available from: https://www.gov.uk/government/publications/falls-applying-all-our-health/falls-applying-allour-health (Accessed February 12, 2025).
3. Lahrmann H, Cortelli P, Hilz M, Mathias CJ, Struhal W, Tassinari M. EFNS guidelines on the diagnosis and management of orthostatic hypotension. European Journal of Neurology,2006:13:930–936.
4. Dani M, Dirksen A, Taraborrelli P, Panagopolous D, Torocastro M, Sutton R, Lim PB. Orthostatic hypotension in older people: considerations, diagnosis and management. Clinical Medicine,2021:21:e275–e282.
5. Saedon NI, Tan MP, Frith J. The prevalence of orthostatic hypotension: a systematic review and meta-analysis. Journal of Gerontology Series A Biological Sciences and Medical Sciences,2020:75:117–122.
6. Mol A, Bui Hoang PT, Sharmin S, Reijnierse EM, van Wezel RJ, Meskers CG, Maier AB. Orthostatic hypotension and falls in older adults: a systematic review and meta-analysis. Journal of the American Medical Directors Association,2019:20:589–597.e5.
7. Scuffham P, Chaplin S, Legood R. Incidence and costs of unintentional falls in older people in the United Kingdom. Journal of Epidemiology and Community Health,2003:57:740–744.
8. Bhanu C, Petersen I, Orlu M, Davis D, Walters K. Incidence of postural hypotension recorded in UK general practice: an electronic health records study. British Journal of General Practice,2023:73:e9–e15.
9. National Institute for Health and Care Excellence. Falls in older people: assessing risk and prevention. NICE Guideline, 2013. Available from: https://www.nice.org.uk/guidance/cg161 (Accessed February 14, 2025).
10. Fleg JL, Evans GW, Margolis KL, et al. Orthostatic hypotension in the ACCORD blood pressure trial: prevalence, incidence, and prognostic significance. Hypertension,2016:68:888–895.
11. Claffey P, Pérez-Denia L, Lavan A, Kenny RA, Finucane C, Briggs R. Asymptomatic orthostatic hypotension and risk of falls in community-dwelling older people. Age and Ageing,2022:51:afac295.
12. Royal College of Physicians. Falls and Fragility Fracture Audit Programme (FFAP) ,2020. Available from: https://www.fffap.org.uk/ (Accessed February 15, 2025).
13. Sherrington C, Michaleff ZA, Fairhall N, et al. Exercise to prevent falls in older adults: an updated systematic review and meta-analysis. British Journal of Sports Medicine,2017:51:1750–1758.
14. Wu H, Pang Q. The effect of vitamin D and calcium supplementation on falls in older adults: a systematic review and meta-analysis. Orthopade,2017:46:729–736.
15. Hauer K, Rost B, Rütschle K, et al. Exercise training for rehabilitation and secondary prevention of falls in geriatric patients with a history of injurious falls. Journal of the American Geriatrics Society,2001:49:10–20.
16. Foote CW, Vanier C, Chen C, Palacio CH. Evaluation of therapy in traumatic elderly falls to return autonomy and functional status. Surgery Open Science,2022:10:174–181.
17. Moyer VA. Prevention of falls in community-dwelling older adults: U.S. Preventive Services Task Force recommendation statement. Annals of Internal Medicine,2012:157:197–204.
18. Clemson L, Stark S, Pighills AC, Torgerson DJ, Sherrington C, Lamb SE. Environmental interventions for preventing falls in older people living in the community. Cochrane Database of Systematic Reviews,2019,2019.
19. Clemson L, Mackenzie L, Ballinger C, Close JC, Cumming RG. Environmental interventions to prevent falls in community-dwelling older people: a meta-analysis of randomized trials. Journal of Aging and Health,2008:20:954–971.
20. Stevens JA, Mahoney JE, Ehrenreich H. Circumstances and outcomes of falls among high-risk community-dwelling older adults. Injury Epidemiology,2014:1:1.