

Empowering Patients and Families Through Vertigo Self-Management Education and Fall Prevention

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ABSTRACT

Background: Vertigo is a balance-related symptom characterized by an illusion of movement that may be accompanied by nausea, activity limitations, sleep disturbances, and an increased risk of falls. Limited knowledge among patients and families regarding symptom management and fall prevention may increase the risk of injury and interfere with daily activities.

Objectives: This community service program aimed to improve the knowledge and practical skills of patients and their families in vertigo self-management and fall prevention.

Methods: The program involved 30 participants consisting of individuals experiencing vertigo and their family members. Activities included health education, demonstration, discussion, and guided practice addressing recognition of vertigo symptoms and triggers, safe positional changes, fall prevention, home safety modification, adequate nutrition and hydration, rest and sleep management, and recognition of warning signs requiring medical attention. Evaluation used pre-test and post-test knowledge assessments and a skills checklist.

Results: The mean knowledge score increased from 58.3 before the program to 85.0 after the program. The proportion of participants demonstrating good vertigo-management and fall-prevention skills increased from 43.3% to 86.7%. Participants also demonstrated better ability to identify potential triggers, perform safer positional changes, improve environmental safety, and recognize conditions requiring medical attention.

Conclusions: Patient- and family-centered education combined with practical training was associated with improved knowledge and self-management skills related to vertigo and fall prevention. Continued education and family involvement are recommended to support safety, independence, and continuity of care.



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Introduction

Vertigo and dizziness are common clinical problems that may arise from peripheral vestibular disorders, central nervous system conditions, cardiovascular abnormalities, medication effects, and other causes. Vertigo is generally experienced as an illusion of movement of oneself or the surrounding environment, whereas dizziness encompasses a broader range of sensations such as lightheadedness and imbalance. Vestibular dysfunction can interfere with postural stability, mobility, activities of daily living, work, and social participation, thereby reducing quality of life (Hall et al., 2022; Fancello et al., 2023).

One clinically important consequence of dizziness and vertigo is an increased risk of falling. A recent systematic review and meta-analysis involving more than 100,000 older adults found that dizziness was associated with higher odds of future falls and recurrent falls (Li et al., 2024). Falls themselves represent a major global public health problem; the World Health Organization identifies them as the second leading cause of unintentional injury death worldwide and emphasizes education, safer environments, and preventive strategies as important interventions.

The risk of injury becomes particularly relevant when vertigo is provoked or worsened by changes in body or head position. Patients may attempt to stand, walk, use stairs, bathe, or perform household activities while experiencing disequilibrium. In benign paroxysmal positional vertigo (BPPV), for example, positional changes can provoke recurrent episodes, and clinical guidelines emphasize assessment of mobility, balance, home support, fall risk, patient education, recurrence, and follow-up (Bhattacharyya et al., 2017). However, vertigo is a symptom with multiple possible etiologies; therefore, self-management education should not encourage patients to assume that every episode is BPPV or to perform specific repositioning maneuvers without an appropriate diagnosis and instruction.

Environmental safety is another important component of prevention. Hazard reduction within the home, including attention to walking surfaces, lighting, access routes, and other environmental risks, can contribute to reducing falls, particularly in individuals with balance impairment. Systematic-review evidence suggests that appropriately targeted home-hazard modification can reduce fall events, supporting the inclusion of environmental safety education within community-based fall-prevention activities (Lektip et al., 2023).

Self-management education may also help patients respond more appropriately when symptoms occur. Effective self-management extends beyond acquiring information; it involves recognizing symptoms, making appropriate daily-care decisions, modifying behavior, identifying situations requiring professional assistance, and using available support. Reviews of self-management interventions indicate that educational approaches addressing health literacy, patient activation, and practical behaviors can improve self-management-related outcomes (Downie et al., 2022; Ruiz-Ramírez et al., 2021).

Family participation is especially relevant when dizziness compromises confidence, mobility, or safety. Family members may assist patients during positional changes, help maintain a safer home environment, observe symptom changes, support adequate food and fluid intake, and facilitate access to healthcare. Evidence from caregiver interventions suggests that education combined with hands-on skills training can improve caregiver knowledge, while demonstration or simulation-oriented education may strengthen practical caregiving skills (Rouch et al., 2021; Hur & Hickman, 2024).

At the same time, patient and family education must include appropriate escalation of care. Acute dizziness or vertigo can occasionally represent serious neurological disease, and contemporary emergency-care guidance emphasizes identifying clinical features suggesting a central or other urgent cause rather than automatically attributing symptoms to a benign vestibular condition (Edlow et al., 2023; Shah et al., 2023).

Based on these considerations, a patient- and family-centered community service program was developed using health education, demonstration, discussion, and guided practice. The program addressed symptom and trigger recognition, safe positional changes, fall prevention, environmental

safety, adequate nutrition and hydration, rest and sleep management, and recognition of warning signs requiring further medical assessment. The program aimed to improve the knowledge and practical skills of patients and their family members regarding vertigo self-management and fall prevention.

Methods

Program Design/Approach

This community service program used a patient- and family-centered educational and skills-training approach. Health education was combined with demonstration, discussion, and guided practice to address both cognitive and practical aspects of vertigo self-management. The approach was selected because knowledge alone may not be sufficient when patients and families must translate information into safety behaviors during episodes of dizziness.

The program emphasized practical risk reduction rather than independent diagnosis or treatment of the underlying cause of vertigo. Participants were therefore taught strategies for symptom observation, safe movement, environmental safety, general supportive self-management, and appropriate healthcare seeking. Specific diagnostic or therapeutic maneuvers for vestibular disorders were not treated as substitutes for professional clinical assessment.

Community Partner and Target Population

The program involved 30 participants, consisting of individuals experiencing vertigo and family members involved in supporting their daily care. The target population was selected because vertigo may compromise balance, activities, rest, dietary intake, and personal safety, while family members can play an important supportive role during symptomatic periods.

The identified educational needs focused on understanding vertigo symptoms, recognizing possible triggers, avoiding unsafe sudden movements, reducing fall hazards, supporting nutrition and hydration, managing rest and sleep, and recognizing symptoms that require professional medical assessment.

Community Service Intervention/Activities

The program was organized into five stages.

Stage 1 – Preparation and Needs Assessment. Educational needs were identified around dizziness and balance problems, fall risk, difficulties with activity, environmental safety, dietary intake, rest, and family support. These needs were translated into practical learning objectives.

Stage 2 – Coordination and Program Planning. Educational content, demonstration activities, discussion topics, guided practice, and evaluation procedures were organized according to the identified problems. Particular emphasis was placed on information that patients and family members could apply safely in daily life.

Stage 3 – Implementation of the Intervention. Participants received structured education covering the nature of vertigo, commonly reported symptoms, symptom and trigger observation, safe positional changes, fall-prevention strategies, home-environment modification, adequate nutrition and hydration, management of rest and sleep, and recognition of warning signs. Demonstrations and guided practice were used for safety-related behaviors, particularly gradual positional changes and environmental risk reduction.

Participants were encouraged to avoid abrupt changes in position when symptomatic, pause before standing or walking, seek assistance when balance was impaired, and maintain accessible and unobstructed walking areas. Family members were encouraged to support rather than unnecessarily replace the patient's safe independent activities.

The program also emphasized that recurrent, persistent, atypical, or severe symptoms require clinical evaluation. Participants were instructed to seek prompt medical care when vertigo was accompanied by concerning neurological or other acute symptoms rather than attempting

unsupported self-treatment. This distinction is consistent with contemporary recommendations for differentiating potentially benign triggered positional vertigo from acute presentations that may require urgent evaluation (Edlow et al., 2023).

Stage 4 – Monitoring and Evaluation. Knowledge was measured before and after the educational intervention. Practical performance was evaluated using a skills checklist assessing participants' application of vertigo self-management and fall-prevention behaviors.

Stage 5 – Follow-up and Sustainability. Participants were encouraged to continue applying safety principles at home, involve family members when assistance was required, review educational information, and seek healthcare evaluation for recurrent or concerning symptoms. Integration of repeated education into routine nursing and community healthcare encounters was recommended for program sustainability.

Table 1. Components of the Vertigo Self-Management and Fall-Prevention Program

Program Component	Educational Content	Strategy	Expected Competency
Understanding vertigo	Symptoms, balance disturbance, functional effects	Education and discussion	Recognize common manifestations of vertigo
Symptom and trigger observation	Situations associated with symptom onset or worsening	Discussion and self-observation	Identify potential individual triggers
Safe positional changes	Gradual changes from lying to sitting and standing	Demonstration and guided practice	Change position more safely
Fall prevention	Safety during mobility and symptomatic episodes	Education and demonstration	Reduce behaviors associated with falls
Home safety	Lighting, walking pathways, slippery surfaces, environmental hazards	Discussion and environmental guidance	Identify and reduce household hazards
Nutrition and hydration	Adequate intake during periods of nausea or reduced appetite	Health education	Maintain appropriate food and fluid intake
Rest and sleep	Rest patterns, sleep-supportive behaviors, avoidance of unnecessary symptom-provoking activity	Health education	Apply appropriate rest strategies
Family involvement	Assistance during symptomatic periods and observation of changes	Discussion and guided participation	Provide appropriate safety support
Warning-sign recognition	Concerning or atypical symptoms requiring professional assessment	Health education	Seek timely medical care

Instruments and Program Evaluation

Program evaluation included two domains: knowledge and practical skills. Knowledge related to vertigo self-management and fall prevention was assessed before and after the program. The mean pre-test score was 58.3, and the mean post-test score was 85.0.

Practical skills were assessed using a skills checklist before and after the educational activities. The proportion of participants categorized as demonstrating good self-management and fall-prevention skills was 43.3% before the program and 86.7% after the program. Observed competencies included identification of possible triggers, safer positional changes, environmental risk reduction, and recognition of situations requiring medical attention.

Data Collection

Data collection followed a structured pre-intervention and post-intervention sequence. Participants initially completed a knowledge assessment and skills evaluation. Health education, discussion, demonstration, and guided practice were subsequently provided. The knowledge assessment and skills evaluation were repeated after completion of the program to identify descriptive changes in participant outcomes.

Data Analysis

Data were analyzed descriptively. Mean scores were used to summarize knowledge outcomes, whereas frequency and percentage were used for the skills classification. Absolute differences

between pre-program and post-program measurements were calculated. No p-values, confidence intervals, or inferential tests are reported because such analyses were not included in the available program dataset.

Ethical Considerations

The manuscript reports program outcomes in aggregate and does not disclose patient or caregiver identities. No individual clinical identifier is presented. Confirmation of the formal participant-consent procedure, institutional/community permission, and ethics-review status should be completed in the journal submission documentation.

Results

Program Implementation

Thirty patients and family members participated in the vertigo self-management and fall-prevention program. The intervention combined education with active learning strategies to strengthen understanding of vertigo while developing practical behaviors that could be applied during everyday activities.

Educational activities covered symptom and trigger recognition, safe position changes, prevention of falls, environmental modification, nutrition and hydration, appropriate rest and sleep, family support, and recognition of conditions requiring medical attention. Participants were actively engaged through discussion and guided practice rather than receiving information through lecture alone.

Changes in Knowledge

The mean knowledge score increased from 58.3 before the program to 85.0 after the program, representing an absolute increase of 26.7 points.

Table 2. Participant Knowledge Before and After the Program

Indicator	Pre-program	Post-program	Absolute Change
Mean knowledge score	58.3	85.0	+26.7

The descriptive improvement indicated greater participant understanding of vertigo self-management, safety strategies, and situations requiring additional healthcare assessment after completion of the educational activities.

Changes in Vertigo Self-Management and Fall-Prevention Skills

Before the program, 43.3% of participants were categorized as demonstrating good skills. After education and guided practice, this proportion increased to 86.7%, representing an increase of 43.4 percentage points.

Table 3. Self-Management and Fall-Prevention Skills Before and After the Program

Indicator	Before Program	After Program	Absolute Change
Participants categorized as demonstrating good skills	43.3%	86.7%	+43.4 percentage points

Participants demonstrated improved ability to recognize possible symptom triggers, perform safer positional changes, identify environmental hazards, and recognize situations requiring medical attention.

Discussion

The program was followed by an increase in mean knowledge from 58.3 to 85.0. This finding suggests that structured education can help patients and families organize information about vertigo into practical actions rather than viewing dizziness only as an unpredictable symptom. Self-management programs are most useful when participants understand their symptoms, become actively involved in health decisions, and know when self-care is appropriate and when professional assessment is required (Downie et al., 2022; Ruiz-Ramírez et al., 2021).

The improvement in practical skills from 43.3% to 86.7% also supports the use of active teaching strategies. Demonstration and guided practice allow educators to identify unsafe techniques immediately and provide corrective feedback. Evidence regarding caregiver education suggests that combining education with practical skills training can improve knowledge, while simulation and hands-on approaches may strengthen caregiver performance in technical or safety-related tasks (Rouch et al., 2021; Hur & Hickman, 2024).

Fall prevention represents a central element of vertigo self-management because dizziness and impaired balance can compromise safe mobility. Li et al. (2024) found that dizziness was associated with a 63% higher odds of experiencing at least one future fall and almost twice the odds of recurrent falls among older adults. Although the present program was not limited to older adults, the association illustrates why balance symptoms should trigger proactive safety education rather than waiting until an injury occurs.

Environmental modification complements behavioral safety strategies. Participants were encouraged to identify obstacles and other environmental conditions that could increase injury risk during symptomatic episodes. A meta-analysis by Lektip et al. (2023) found that appropriately targeted home-hazard modification programs could reduce falls among older adults, while international fall-prevention guidance similarly recommends considering environmental hazards as part of multidomain risk assessment and prevention (Montero-Odasso et al., 2022).

Teaching safer positional changes was also clinically relevant. Certain vestibular disorders, particularly BPPV, produce episodes triggered by changes in head position. The BPPV clinical practice guideline recommends appropriate diagnostic positional testing and canalith repositioning treatment, together with education concerning safety, recurrence, follow-up, and factors modifying management (Bhattacharyya et al., 2017). Evidence syntheses have further demonstrated that the Epley maneuver is effective for appropriately diagnosed posterior-canal BPPV (Khoujah et al., 2023; AlMohiza, 2023).

However, this evidence also highlights an important boundary for community education. Vertigo is not synonymous with BPPV. Specific repositioning procedures should be taught only to appropriately assessed patients when the underlying vestibular condition and affected canal have been established. Contemporary emergency dizziness guidance emphasizes differentiating triggered positional syndromes from acute central causes, particularly when neurological findings or atypical clinical features are present (Edlow et al., 2023; Shah et al., 2023).

For selected patients with established vestibular disorders, structured home management can be valuable. Vestibular rehabilitation is supported for appropriate peripheral vestibular hypofunction, and studies of diagnosed BPPV have shown that properly instructed home-based approaches can reduce symptoms and disability (Hall et al., 2022; Piromchai et al., 2019; Hanapi et al., 2026). These findings support education and guided practice but also reinforce the importance of matching home activities to the patient's actual diagnosis.

Family involvement further strengthens the program because safety behaviors often occur outside healthcare facilities. Family members can remind patients to avoid hazardous movement while symptomatic, assist when balance is impaired, help reduce environmental hazards, observe changes in symptoms, and facilitate access to medical assessment. This role is particularly important when dizziness reduces the patient's confidence or independence.

Nutrition, hydration, rest, and sleep management were included as supportive components rather than specific treatments for the underlying cause of vertigo. Vertigo may be accompanied by nausea, vomiting, reduced oral intake, fatigue, or disruption of daily activities. These components therefore aimed to maintain general well-being and prevent avoidable problems during symptomatic periods while emphasizing that persistent symptoms require evaluation of their underlying cause.

Recognition of warning signs was another essential element. Dizziness may occasionally be a manifestation of a serious central neurological disorder, and no community self-management program should encourage individuals to delay assessment when symptoms are atypical or

accompanied by concerning clinical features. GRACE-3 recommendations emphasize structured evaluation based on timing, triggers, eye findings, gait stability, and evidence of cerebral ischemia rather than relying on symptom labels alone (Edlow et al., 2023).

Overall, the results demonstrate the feasibility of integrating symptom education, practical safety training, environmental modification, and family participation into a single community service program. The pre-post improvements are encouraging but should be interpreted as descriptive program outcomes. Without a comparison group or inferential testing, the findings do not establish causal effectiveness.

Implications, Sustainability, and Limitations

The program has direct implications for nursing practice. Nurses can incorporate short vertigo-safety assessments into patient education, including the circumstances in which dizziness occurs, fall history, mobility confidence, environmental hazards, family support, and understanding of warning signs. Education should move beyond verbal advice by allowing patients and families to practice relevant safety behaviors under supervision.

Sustainability may be promoted through repeated education during follow-up visits, family reinforcement at home, accessible educational materials, and integration with primary-care or community nursing programs. Where patients have a confirmed vestibular disorder requiring rehabilitation or repositioning treatment, referral and follow-up with appropriately trained healthcare professionals remain important.

Several limitations require consideration. The program used a descriptive before-and-after evaluation without a comparison group or inferential analysis. The available dataset did not distinguish the number of patients from the number of family participants or provide detailed demographic characteristics. Evaluation was focused on immediate knowledge and skills, so long-term retention of self-management behavior was not established. The program did not evaluate actual fall incidence, recurrence of vertigo, healthcare utilization, or quality-of-life outcomes. Therefore, the findings should not be interpreted as evidence that the program reduced falls or treated the underlying cause of vertigo.

Relevance for Practice

Patient education for vertigo should integrate safety assessment with practical self-management preparation. Nurses can teach patients and families to recognize symptoms, identify individual situations associated with worsening dizziness, make gradual positional changes, avoid unsafe mobility during symptomatic episodes, remove environmental hazards, maintain appropriate supportive care, and seek medical assessment when symptoms are persistent, atypical, or associated with warning signs. Demonstration followed by supervised practice can help healthcare professionals verify that participants understand not only what they should do but also how to perform safety-related behaviors appropriately. Specific vestibular maneuvers should be reserved for patients whose diagnosis has been appropriately established and who have received suitable professional instruction.

Conclusion

The patient- and family-centered community service program was followed by improved knowledge and practical skills related to vertigo self-management and fall prevention. Combining health education with discussion, demonstration, and guided practice provided participants with practical strategies for symptom observation, safer positional changes, environmental risk reduction, and appropriate healthcare seeking. Family participation strengthened the safety-oriented approach by extending support into everyday activities at home. Continued education, follow-up, and integration of vertigo-safety preparation into routine nursing and community health services are recommended to promote patient safety and independence.

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Author Contribution

Inez Wulansari contributed to the conceptualization of the community service program, needs assessment, program planning, implementation of health education and fall-prevention training, data collection, program evaluation, literature review, data interpretation, and preparation of the original manuscript.

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Declaration of Conflicting Interest

The authors declare no conflict of interest related to the implementation of this community service program or the publication of this manuscript.

Declaration of Use of AI in Scientific Writing

The authors declare that generative AI and AI-assisted technologies were used solely to support language editing, grammatical refinement, and improvement of the clarity and readability of the manuscript. The authors reviewed, verified, and revised all AI-assisted content and remain fully responsible for the accuracy, integrity, interpretation, and final content of the manuscript.

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