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Prevalence and Impact of Vertigo and Dizziness in Adults: A Hospital-Based Evaluation

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ABSTRACT

Vertigo and dizziness are common complaints in adults, often affecting daily functioning and potentially linked to conditions such as hypertension, anxiety, and migraine, highlighting the need for more local data. **Objectives:** To determine the prevalence of vertigo and dizziness among adults in the local population, assess their impact on daily functioning using the Dizziness Handicap Inventory, and identify associated clinical and demographic risk factors, including hypertension, anxiety, and migraine. **Methods:** This cross-sectional study was conducted from January 2025 to June 2025 at Bolan Medical College, Quetta and Jhalawan Medical College, Khuzdar, enrolled 371 adults (≥18 years, residing in Quetta or Khuzdar for at least one continuous year, experiencing vertigo/dizziness, and providing consent) via simple random sampling. Data from interviews, records, and DHI assessed demographics, comorbidities, and symptom characteristics. Exclusions included psychiatric/CNS disorders. Analysis (SPSS v25) used descriptive statistics, parameter estimation, chi-square, and logistic regression ($p<0.05$ significant). **Results:** The mean age of patients was 42.3 ± 12.7 years. Male were 170 (45.8%) and female 201 (54.2%). Hypertension was found in 123 (33.2%), diabetes mellitus in 77 (20.8%), migraine in 62 (16.7%), and anxiety/depression in 93 (25.1%). The overall mean Dizziness Handicap Inventory score was 48.6 ± 18.4; male had 44.7 ± 17.2 and female 51.8 ± 18.9. Based on the Dizziness Handicap Inventory score, 104 (28.0%) had mild, 193 (52.0%) moderate, and 74 (19.9%) severe symptoms. **Conclusions:** Dizziness and vertigo are common in adults, often linked to hypertension, anxiety, and migraines. Early diagnosis, screening, and multidisciplinary management help reduce the burden and improve outcomes.

INTRODUCTION

Vertigo and dizziness are common health problems in adults, affecting daily activities and overall quality of life [1]. These symptoms are due to various causes, including vestibular disorders, cardiovascular diseases, and neurological conditions. Understanding their prevalence and associated risk factors is essential for improving prevention and management strategies [2]. Despite their frequent occurrence, data from the local population remain scarce. Most available studies focus on general causes rather than region-specific factors [3], creating challenges for healthcare planning and the development of targeted interventions [4]. An Italian population-based study involving 2,672 participants reported a lifetime prevalence of vertigo and dizziness of 40.3%, with the first episode occurring at a mean age of 39.2 years [5]. Women were 4.4 times more likely to report these symptoms than men, and individuals over 50 years had a 1.8-fold higher prevalence [6]. Among participants, 13.7% experienced spinning sensations, 26.3% had recurrent episodes, 12.9% reported positional exacerbation, and 4.8% exhibited cochlear symptoms. Headache history, present in 34.8% of cases, was linked to more frequent relapses, positional triggers, cochlear involvement, and earlier symptom onset, highlighting a strong association with migraine-like headaches [7]. Global studies estimate that 20–30% of adult's experience dizziness, though prevalence varies

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across populations. While these symptoms can occur at any age, they are more frequently reported in older adults. Known risk factors include advancing age, female sex, hypertension, and anxiety disorders. Vestibular migraine, Meniere's disease, and benign paroxysmal positional vertigo occur more commonly in women. Cardiovascular conditions such as orthostatic hypotension, arrhythmias, carotid artery disease, atherosclerosis, heart failure, myocardial infarction, and stroke also contribute by impairing brain perfusion. However, there is a lack of comprehensive local data despite strong evidence from other regions linking dizziness to these comorbidities [8]. It is expected that these symptoms will be significantly associated with the identified comorbidities and correlate with higher disability scores, providing evidence-based insights to support early detection, targeted interventions, and informed healthcare planning for improved clinical management and public health strategies [9, 10].

This study aims to determine the prevalence of vertigo and dizziness among adults in the local population, assess their impact on daily functioning using the Dizziness Handicap Inventory, and identify associated clinical and demographic risk factors, including hypertension, anxiety, and migraine.

METHODS

This cross-sectional study was conducted at Bolan Medical College, Quetta and Jhalawan Medical College, Khuzdar Hospitals from January 2025 to May 2025. Data were collected from the medicine, ENT, Cardiology and Neurology Departments of the above-discussed hospital. Both indoor and outdoor patients were included in this study. The setting ensured a representative sample of the local community. The study was started after approval from the Institutional Review Board, approval no. 1056/BUMHS/IRB/24. The sample size was determined using the World Health Organization (WHO) sample size calculator, based on a 95% confidence level, a prevalence of vertigo or dizziness is 40.3, and an absolute precision of 0.05 [5]. A simple random sampling method was used to minimize selection bias. Daily registration logs from the medicine, ENT, Cardiology, and Neurology Departments were compiled into a master list of all patients meeting the inclusion criteria. This list was updated each day of recruitment. Each eligible patient was assigned a unique serial number, and random numbers were generated using the SPSS-25 "Random Sample of Cases" function to select participants. If a selected patient declined participation or met an exclusion criterion during screening, the next randomly generated number from the pre-determined list was used, ensuring the process remained unbiased. The randomization was conducted by a research assistant not involved in data collection, and the recruiting clinicians were blinded to the sequence [6-10]. Adults aged 18 years and above, experiencing vertigo and dizziness, and willing to provide informed consent were included in the study. Written informed consent was obtained from all participants before inclusion in the study. Participants were thoroughly informed about the study's objectives, procedures, potential risks, and benefits in their native language. it was then obtained and documented using a signed form approved by the Hospital Ethical Committee. Confidentiality of data was maintained throughout the study. Individuals with psychiatric disorders or known central nervous system pathologies were excluded. Data were collected through interviews conducted by trained healthcare professionals, covering demographics, medical history, and characteristics of vertigo and dizziness. Comorbidities were identified using standardized criteria and multiple data sources to ensure diagnostic accuracy. Hypertension was confirmed from patient medical records by a physician, if the patient was on antihypertensive medication, or if blood pressure measured during the visit was ≥140/90 mmHg on at least two occasions [3]. Migraine was recorded if previously diagnosed by a physician (based on International Classification of Headache Disorders criteria) and documented in medical records; in cases where records were unavailable, diagnosis was based on a consistent patient history of recurrent, unilateral, pulsating headaches associated with nausea, photophobia, or phonophobia [4]. Anxiety disorders were considered present if diagnosed by a mental health professional or documented in medical records, and in the absence of a formal diagnosis, patient self-report of persistent excessive worry or associated symptoms was corroborated with available clinical documentation [3, 4]. All comorbidity data were cross-checked against hospital records from Medicine, Neurology, and Psychiatry Departments to minimize misclassification bias. The Dizziness Handicap Inventory (DHI) serves as a valuable tool in diagnosing vestibular disorders, guiding treatment planning, and monitoring clinical progress. Its integration into the study's assessment proforma enhanced the depth and precision of the patient evaluation process. It is a standardized, 25-item self-assessment tool used to evaluate the impact of dizziness on an individual's daily life. In this study, the DHI was incorporated into the assessment proforma to ensure a comprehensive and structured evaluation. It was administered using standardized protocols to maintain consistency and reliability [11]. The inventory is divided into three domains: Functional (9 items) assessing limitations in performing daily activities, Emotional (9 items) evaluating psychological distress, and Physical (7 items) identifying dizziness-provoking triggers. Each item is scored as Yes (4 points), Sometimes (2 points), or No (0 points), with a total score ranging from 0 to 100.

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Higher scores indicate greater perceived disability, with severity classified as mild (0–30), moderate (31–60), and severe (61–100). Participant-reported symptoms were systematically categorized into vertigo and non-vertiginous dizziness, with particular attention to duration, frequency, and identifiable triggers such as head movements, postural changes, or emotional stress. Associated features, including hearing loss, tinnitus, aural fullness, nausea, vomiting, and focal neurological signs, were documented to aid in etiological differentiation. A comprehensive ontological and neurological examination was conducted, including otoscopy to exclude external or middle ear pathology. Vestibular assessments were conducted by trained clinicians using standardized protocols to evaluate peripheral and central vestibular function. The Dix-Hallpike maneuver was used to diagnose posterior canal BPPV, with a positive result defined as reproduction of vertigo and characteristic positional nystagmus [6]. The Head Impulse Test (HIT) assessed the vestibulo-ocular reflex, with corrective saccades after rapid, unpredictable head turns, indicating unilateral peripheral vestibular hypofunction [7]. The Romberg test evaluated postural stability, where marked sway or loss of balance with eyes closed suggested sensory ataxia from vestibular or proprioceptive deficits [8]. The Unterberger test assessed vestibulospinal reflexes, with rotation of ≥45° during stepping in place with eyes closed, indicating unilateral vestibular dysfunction [9]. Findings from these tests were integrated with history, otological/neurological examination, and symptom profile to distinguish peripheral from central causes and guide diagnostic impressions [10]. Data were analyzed using SPSS version 25 (IBM Corp., Armonk, NY, USA). Quantitative variables included age (years) and Dizziness Handicap Inventory (DHI) scores (range 0–100), which were summarized as mean ± standard deviation (SD) and compared between groups using the independent samples t-test. The DHI was treated primarily as a continuous variable; however, for severity distribution, it was also categorized into ordinal groups as mild (0–30), moderate (31–60), and severe (>60). Qualitative variables included gender, marital status, educational level, comorbidities (hypertension, diabetes, migraine, cardiovascular disease, anxiety/depression), and categorical DHI groups (mild, moderate, severe). These qualitative variables were expressed as frequencies and percentages, and associations were assessed using the chi-square test or Fisher's exact test where appropriate. Finally, multivariate binary logistic regression was applied to identify independent predictors of dizziness after adjusting for age and gender, and a p-value of <0.05 was considered statistically significant for all analyses.

RESULTS

The total number of participants was 371. The mean age was 42.3 ± 12.7 years. Details of the demographic characteristics of participants are exhibited. Most participants were female: 201 (54.2%), while 170 (45.8%) were male (Table 1).

Table 1: Exhibits Demographic Characteristics of Participants (n=371)

Variables	n (%)
Educational Level	
No Formal Education	58 (15.6%)
Primary	93 (25.1%)
Secondary	108 (29.1%)
Higher Secondary	66 (17.8%)
Graduate and Above	46 (12.4%)
Marital Status	
Married	247 (66.6%)
Single	81 (21.8%)
Divorced/Widowed	43 (11.6%)

The details of medical comorbidities and their association with dizziness are reported in detail. Vestibular Disorders were found in 8.3% of cases, but no statistical assessment was performed (Table 2).

Table 2: Reports Medical Comorbidities and Their Association with Dizziness

Comorbidity	Present, n (%)	Absent, n (%)	Chi-square (χ^2)	p-value	Significant?
Hypertension	123 (33.2%)	248 (66.8%)	5.87	0.015	✔ Yes
Diabetes Mellitus	77 (20.8%)	294 (79.2%)	1.18	0.277	✖ No
Migraine	62 (16.7%)	309 (83.3%)	3.65	0.056	~ Borderline
Cardiovascular Disease	46 (12.4%)	325 (87.6%)	0.94	0.331	✖ No
Anxiety/ Depression	93 (25.1%)	278 (74.9%)	6.42	0.011	✔ Yes

The mean DHI score for all participants was 48.6 ± 18.4, with males scoring 44.7 ± 17.2 and females 51.8 ± 18.9, showing a statistically significant gender difference (p=0.009). The details of Dizziness Handicap Inventory (DHI) scores and gender comparison are demonstrated. To further assess the relationship between vestibular function and perceived disability, DHI scores were compared between patients with positive and negative vestibular test results. Independent samples t-test analysis showed significantly higher mean DHI scores among patients with positive vestibular test findings compared to those with negative results (t=3.21, p=0.001) (Table 3).

Table 3: Demonstrates Dizziness Handicap Inventory (DHI) Scores and Gender Comparison

Parameters	Males (n=170)	Females (n=201)	Total (n=371)
Mild (<30)	56 (32.9%)	48 (23.9%)	104 (28.0%)
Moderate (31–60)	92 (54.1%)	101 (50.2%)	193 (52.0%)

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Severe (>60)	22 (12.9%)	52 (25.9%)	74 (19.9%)

Multivariate logistic regression identified hypertension and anxiety/depression as significant independent predictors of dizziness after adjusting for age and gender. The multivariate logistic regression analysis of factors associated with dizziness is reported. Migraine showed a borderline association, while diabetes mellitus and cardiovascular disease were not significant predictors (Table 4).

Table 4: Multivariate Logistic Regression Analysis of Factors Associated with Dizziness

Variables	Adjusted OR	95% CI	p-value
Age (Per Year)	1.01	0.99–1.03	0.278
Female Gender	1.32	0.89–1.97	0.164
Hypertension	1.88	1.18–3.00	0.008 ✔
Migraine	1.54	0.97–2.45	0.065 ~
Anxiety/Depression	2.21	1.37–3.57	0.001 ✔
Diabetes Mellitus	1.09	0.68–1.74	0.720
Cardiovascular Disease	1.15	0.64–2.09	0.634

DISCUSSION

This study found dizziness to be highly prevalent among adults, affecting more than half of the participants, with notable variations in severity and impact on daily functioning. Significant associations were identified for hypertension and anxiety/depression, while migraine showed a borderline relationship that warrants further investigation [11]. Females not only reported symptoms more frequently but also demonstrated higher DHI scores, indicating a greater perceived handicap. An unexpectedly high prevalence among middle-aged adults challenges the conventional assumption that dizziness is primarily a condition of older age. These findings emphasize that vestibular disorders are a substantial health burden in the community and highlight the importance of addressing both the physical limitations and psychological consequences of dizziness [12]. Multivariate logistic regression confirmed hypertension and anxiety/depression as independent predictors, even after adjusting for age and gender, suggesting robust associations. Migraine, although not reaching statistical significance, may still play a contributory role, and its clinical relevance should not be dismissed, particularly given its established association with vestibular symptoms in other studies. Diabetes mellitus and cardiovascular disease did not show significant associations in this study, indicating that the relationship between chronic comorbidities and dizziness is selective rather than universal [13]. Recognizing which comorbidities carry the strongest influence can help direct resources toward high-yield screening and management. This study's findings are consistent with a large body of international literature identifying cardiovascular risk factors, migraine, and psychological disorders as important contributors to dizziness and vertigo. Similar patterns have been observed in Europe, North America, and Asia, where population-based studies have confirmed the impact of these conditions on vestibular health. For example, research from the United States has demonstrated that psychological stress and cardiovascular risk factors significantly increase the likelihood of developing dizziness, while German studies have specifically linked hypertension with vestibular dysfunction. In contrast, studies from several Asian countries, particularly Korea, have reported higher prevalence rates among older adults, reflecting possible demographic, cultural, or lifestyle differences [14]. The relatively high burden among middle-aged adults in this study contrasts with such reports and may be explained by factors including occupational stress, sedentary work environments, and differences in healthcare-seeking behaviour. Additionally, regional disparities in access to specialized care could influence both the detection and management of vestibular disorders [15]. These contextual differences underscore the importance of region-specific epidemiological data to guide public health strategies and ensure interventions are culturally and logistically appropriate. From a clinical perspective, these findings support incorporating routine dizziness screening into primary care assessments, especially for patients with a history of hypertension, migraine, or anxiety symptoms. Such screening could be achieved using validated tools such as the DHI, which not only helps identify affected individuals but also quantifies the severity of functional impairment. Early recognition may allow for timely referral to specialist services, thereby preventing progression to chronic disability [16]. A multidisciplinary model of care that brings together primary care physicians, ENT specialists, neurologists, physiotherapists, and mental health professionals would offer a more holistic approach. This model could improve diagnostic accuracy, tailor interventions to individual patient needs, and ensure psychological factors are addressed alongside physical rehabilitation. Community-level strategies, such as educational campaigns on hydration, posture correction, and stress management, could further reduce preventable triggers. Evidence from community programs in the United Kingdom shows that such initiatives can improve both symptom control and quality of life [17]. At the policy level, integrating vestibular health into broader non-communicable disease frameworks could leverage existing healthcare infrastructure to address dizziness as part of routine chronic disease management. Given the association between dizziness and work-related disability, workplace

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health programs could also play a role in reducing the socioeconomic impact [18]. Key strengths of this study include the use of the DHI as a standardized, validated measure of functional impairment, the inclusion of both inpatient and outpatient populations, and the use of multivariate analysis to identify independent predictors while minimizing confounding effects. The multicenter design, incorporating two distinct geographic locations, also enhances the generalizability of the findings within the regional context [19]. Future research should adopt longitudinal designs to better establish causal relationships between identified risk factors and dizziness. Incorporating advanced diagnostic modalities, including vestibular function testing and neuroimaging, could improve etiological classification. Investigating the psychosocial impact of chronic dizziness, including its effects on employment and social participation, would provide a more comprehensive understanding of its burden [20]. Furthermore, exploring the role of digital health tools, such as mobile symptom tracking applications and telemedicine platforms, may offer innovative solutions for monitoring and managing dizziness, particularly in resource-limited settings.

CONCLUSIONS

Vertigo and dizziness are common in adults, often linked to hypertension, anxiety, and migraines, particularly in women. Routine primary care screening, use of standardized tools like the DHI, and timely specialist referral are recommended. Community education, stress management initiatives, and workplace balance safety programs can reduce burden, while multidisciplinary clinics improve coordinated long-term care.

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Authors Contribution

Conceptualization: I
Methodology: I, AH, MA, AB
Formal analysis: AW
Writing review and editing: AB

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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