

Assessment of quality of life in hispanic patients with vestibular disorders using EQ-5D 3L, VAS and Dizziness Handicap Inventory Questionnaire

Alejandro Gómez-Roldan

Universidad Pontificia Bolivariana. Medellín, Colombia

José Robles

Universidad Pontificia Bolivariana. Medellín, Colombia

Isabela Franco

Universidad Pontificia Bolivariana. Medellín, Colombia

Santiago Valencia

Universidad Pontificia Bolivariana. Medellín, Colombia

Johanna Vanegas-Munera

Universidad Pontificia Bolivariana. Medellín, Colombia

Melissa Castillo-Bustamante (✉ melissa.castillo@upb.edu.co)

Universidad Pontificia Bolivariana. Medellín, Colombia

Jorge Madrigal

Centro de Vértigo y Mareo. Mexico City, Mexico

Research Article

Keywords: quality of life, vestibular system, vestibular disorders, vestibular migraine, Meniere's disease, Vestibular Neuritis, Postural Perceptual Positional Dizziness

Posted Date: October 2nd, 2023

DOI: <https://doi.org/10.21203/rs.3.rs-3396915/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: Vestibular disorders often lead to physical impairments, an increased risk of falls, elevated rates of anxiety and depression, and a significant reduction in quality of life (QoL).

While previous studies have consistently documented the adverse effects of vestibular disorders on QoL, limited research has employed uniform tools like the EQ-5D 3L to assess these effects across different vestibular conditions. This study aimed to bridge this gap by investigating Hispanic/Latin patients with acute, episodic and chronic vestibular disorders, using the EQ-5D 3L and VAS questionnaire and Dizziness Handicap Inventory.

Methods: A Cross-sectional study was conducted across three specialized vertigo and dizziness centers in Mexico City, Guadalajara, and Medellín. Patients diagnosed with vestibular disorders were administered the EQ-5D-3L, EQ VAS, and Dizziness Handicap Inventory (DHI) questionnaires.

Results: A substantial negative impact on QoL, with mobility impairment, self-care difficulties, and challenges in performing daily activities affecting a significant proportion of patients. The study found no significant differences in EQ-5D and VAS scores between females and males with vestibular disorders, and patients with acute and episodic vestibular syndromes exhibited comparable scores. In contrast, patients with chronic vestibular syndromes showed significantly lower EQ-5D and VAS scores. Additionally, lower scores on the DHI were observed in patients with episodic and chronic vestibular syndromes, further indicating the profound effect of these conditions on QoL.

Conclusion: This study underscores the significant and diverse impact of vestibular disorders on the QoL of Hispanic/Latin patients and highlights the importance of using standardized tools like the EQ-5D 3L for comprehensive assessment.

Introduction

Vertigo is among the most common causes of presentations in emergency departments worldwide. At least 13% of consultations in both emergency services and outpatient settings are linked to vertigo, dizziness, and unsteadiness (1). These symptoms can result in physical impairment, an elevated risk of falls, increased rates of anxiety and depression, and a disruption in the quality of life (QoL) (2). This impact on quality of life has been consistently documented in numerous studies (3). Some of the questionnaires employed for assessment have focused on mobility, anxiety, depression, vertigo severity, and psychological factors (3). Notable among these are the Dizziness Handicap Inventory (DHI), Beck Depression Inventory (BDI), Symptom Checklist-90-Revised questionnaire, Hamilton Anxiety Rating Scale, Hamilton Depression Rating Scale, clinical global impression, and the EQ-5D 3L (3). To date, various evaluations of QoL have highlighted that patients with newly diagnosed or chronic vestibular disorders may experience clinical, social, and physical ramifications (3). For patients with Meniere's disease, benign paroxysmal positional vertigo, vestibular neuritis, and vestibular schwannoma, specific adverse outcomes

have been reported, including lower scores on the Dizziness Handicap Inventory (DHI) and Beck Depression Inventory (BDI) (3).

A notable decline in quality of life has been observed in individuals with chronic vestibular conditions, including Meniere's disease, vestibular migraine, unilateral vestibulopathy, and persistent postural-perceptual dizziness (PPPD) (4). Various assessments have been employed to indirectly gauge their quality of life. For instance, Meniere's disease has been assessed using the Center for Epidemiologic Studies–Depression Scale, Quality of Wellbeing Scale, and the Medical Outcomes Study SF-12 (5). PPPD is often evaluated using the Dizziness Handicap Inventory (DHI), EQ-5D, and the Depression, Anxiety, Stress Scale (DASS-21) (4). Vestibular migraine assessments commonly include the Dizziness Handicap Inventory (DHI), Beck Depression and Anxiety Scales, Somatic Symptom Scale-8 (SSS-8), Short Form (36) Health Survey (SF-36), and the Big Five Inventory (BFI) (6). However, despite the indirect insights into quality of life provided by most of these questionnaires, there remains a paucity of information on how quality of life is impacted in patients with episodic and chronic vestibular disorders using a uniform tool such as EQ-5D 3L (4, 5). In this context, we conducted a study involving Hispanic/Latin patients with episodic and chronic conditions, such as Meniere's disease, vestibular migraine, unilateral vestibulopathy, and persistent postural-perceptual dizziness, utilizing the EQ-5D 3L and VAS questionnaire.

Methods

A cross-sectional study was conducted between April 2023 and August 2023 at three centers specializing in vertigo and dizziness located in Mexico City, Guadalajara, and Medellín. Patients diagnosed with vestibular disorders according to the Barany Society criteria were recruited for the study. During consultations, patients were administered the EQ-5D-3L, visual analogue scale (EQ VAS) and Dizziness Handicap Inventory (DHI) questionnaires. An informed consent was obtained from all participants. This study received approval from the Institutional Review Board (IRB) of Universidad Pontificia Bolivariana, which oversees all three centers.

The EQ-5D-3L descriptive system comprises five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each dimension offers three levels: no problems, some problems, and extreme problems. Patients were asked to indicate their health state by selecting the most appropriate statement within each of the five dimensions. This selection resulted in a one-digit number that represented the chosen level for that dimension. These five digits were then combined into a five-digit number to describe the patient's overall health state (4).

The Dizziness Handicap Inventory (DHI) stands out as one of the widely utilized questionnaires for evaluating the impact of dizziness (6). Originally crafted by Jacobson and Newman, the DHI serves as a tool to gauge the level of disability (6). Comprising 25 items, it aims to discern dizziness-related alterations and categorizes them into three domains: Functional, emotional, and physical. It's worth noting that in certain studies examining patients with vestibular issues, adaptations to these domains have been observed, differing from the original structure (6).

Classification of vestibular syndromes

We classified all included patients into five categories based on the International Classification from the Bárány Society and predefined criteria: (1) acute, (2) episodic and (3) chronic vestibular syndrome, (4) acute imbalance syndrome and (5) patients not classifiable (unclear). (6–13) We defined vestibular syndromes below.

Acute Vestibular Syndrome (AVS): Defined as an acute onset of continuous dizziness lasting days to weeks.

Typically includes symptoms suggestive of new or ongoing dysfunction in the vestibular system, such as vomiting, nystagmus, and severe postural instability.

While AVS is characterized by a single, monophasic event due to a one-time disorder, it may also be the start of a recurrent or progressive illness.

Subclassifications of AVS include t-AVS (postexposure dizziness after trauma or toxic exposure) and s-AVS (spontaneous AVS), which includes patients with continuous dizziness at rest. For simplicity, all these cases are grouped under the term AVS (6–13).

Episodic Vestibular Syndrome (EVS):

Characterized by transient dizziness lasting seconds to hours, rarely days. Accompanied by short episodes of nausea, nystagmus, and sudden falls. EVS can occur repetitively due to episodic disorders with repeated spells or as a single event in progressive chronic disorders with transient or recurrent dizziness. Subtypes of EVS include t-EVS (triggered by specific events) and s-EVS (spontaneous EVS). Diagnosis of s-EVS relies mainly on the patient's history, while t-EVS often presents with clinical signs like positional nystagmus after provocation (6–13).

Chronic Vestibular Syndrome (CVS):

Typically persists for months to years. Associated with continuous dysfunction in the vestibular system, leading to symptoms such as oscillopsia, nystagmus, gait unsteadiness, and falls (6–13).

The EQ VAS records the patient's self-rated health on a vertical visual analogue scale, with the endpoints labeled as 'Best imaginable health state' and 'Worst imaginable health state.' The VAS serves as a quantitative measure of health outcome that reflects the patient's own judgment. Statistical analysis was conducted using GraphPad 9.0 (San Diego, CA). A t-test was applied, and linear regression was utilized for the correlational analysis between EQ5D and VAS scores.

Results

The study analyzed 120 patients, consisting of 90 women and 30 men, with a median age of 45 years (IQR 35.58). Patients were diagnosed with acute vestibular syndromes (including vestibular neuritis)

(20%), episodic vestibular syndromes (including Meniere's Disease, Vestibular Migraine and Benign Paroxysmal Positional Vertigo) (55%) and chronic vestibular syndromes (including Bilateral Vestibulopathy, Postural Perceptual Persistent Dizziness) (25%). At least 18.3% of patients reported anxiety, depression, stress, and panic syndromes.

Patients were asked for daily activities and their affection in their quality of life. Active movements (65%), during outdoor activities (37%), standing and walking (25.8%), driving (20.2%) and lying down (2.2%) were the most common activities interrupted or deferred due to vestibular disorders.

The activities most affected by vestibular disorders in patients included visiting the supermarket (32%), attending parties or social gatherings (24%), Outdoor activities (24%), sport activities (24%), driving (18%), and working (18%). At least 94% of patients with vestibular disorders indicated they had a negative impact in their quality of life.

In the EQ-5D results, 35% presented mobility impairment, 17% had problems in washing or dressing themselves, 30% faced difficulties performing daily activities. Only 20% of patients did report pain or discomfort. At least 32% of patients indicated moderate levels of anxiety or depression.

A simple linear regression was conducted to assess the correlation between the age of the population and the scores obtained in the EQ-5D and VAS. No significant differences were found between females ($R = 0.009$; $P = 0.47$) and males ($R = 0.061$; $P = 0.30$). (Fig. 1).

There was no significant difference in the EQ-5D and VAS scores in patients with acute vestibular syndromes and episodic vestibular syndromes. In patients with chronic vestibular syndromes shown significant lower EQ-5D and VAS scores ($R = 0.74$, $P = 0.02$) (Fig. 2).

Dizziness Handicap Inventory Scores and EQ-5D scores were compared. In patients with episodic and chronic vestibular syndromes significant lower scores were described ($R = 0.06$, $P = 0.001$ vs $R = 0.14$, $P = 0.02$) (Fig. 3).

Discussion

Vestibular diseases are a significant public health concern, affecting individuals' daily lives and overall well-being. Our study reaffirms the higher prevalence of these conditions among females and underscores the debilitating impact of vestibular disorders on quality of life. Awareness, early diagnosis, and optimal medical care are paramount to improving the lives of those living with these conditions. Additionally, addressing the psychological aspects of vestibular diseases should be an integral part of their management. Our research contributes to the growing body of knowledge surrounding vestibular diseases and their multifaceted effects, paving the way for more targeted interventions and improved patient outcomes.

Globally, vestibular diseases exhibit a high prevalence in both genders; however, a higher incidence is observed in females, a trend consistent with our study's findings. (13–20). We noted a significant

prevalence of vestibular migraine among our patients, which can be attributed to the fact that the majority were women. This vestibular disorder is most prevalent in this group and is a leading cause of episodic vertigo (13–15).

Perhaps one of the most concerning aspects of our study is the prevalence of depressive or anxious symptoms among patients. Over half of the participants reported experiencing such symptoms (59.55%), consistent with prior research (16). The close relationship between vestibular disorders and psychological well-being is well-documented. It is imperative to recognize and address these mental health aspects in the management of vestibular diseases.

Our study's most significant revelation is the profound impact of vestibular diseases on patients' quality of life. A staggering majority (94%) reported a negative impact on their quality of life, emphasizing the importance of comprehensive care for individuals suffering from these disorders. It is crucial that medical professionals, including primary care physicians, neurologists, and otolaryngologists, are well-equipped to diagnose and manage vestibular diseases effectively (17).

While our study sheds light on critical aspects of vestibular diseases, such as prevalence, symptomatology, and psychological impact, it is important to acknowledge its limitations. The primary limitation lies in the sample size, which may not fully represent the diversity of patients with vestibular disorders. Future research should aim to include larger and more diverse cohorts to obtain a more comprehensive understanding.

Conclusion

The study highlights the significance of vestibular diseases as a public health concern, with a higher prevalence among females. Vestibular migraine is a leading cause of episodic vertigo, mainly affecting women. The study emphasizes the strong link between vestibular disorders and psychological well-being, with over half of patients reporting depressive or anxious symptoms. It reveals that these conditions have a profound negative impact on the quality of life for the majority of patients. Early diagnosis, medical care, and awareness are crucial for improving the lives of those with vestibular disorders. However, the study acknowledges limitations, such as sample size, and calls for larger, more diverse research cohorts to gain a comprehensive understanding,

References

1. Brandt T, Dieterich M. The dizzy patient: don't forget disorders of the central vestibular system. *Nat Rev Neurol*. 2017;13(6):352–362. doi: 10.1038/nrneurol.2017.58. Epub 2017 Apr 21. PMID: 28429801.
2. Mira E. Improving the quality of life in patients with vestibular disorders: the role of medical treatments and physical rehabilitation. *Int J Clin Pract*. 2008;62(1):109–14. doi: 10.1111/j.1742-1241.2006.01091.x. Epub 2007 May 30. PMID: 17537195.

3. Molnár A, Maihoub S, Mavrogeni P, Tamás L, Szirmai Á. Depression scores and quality of life of vertiginous patients, suffering from different vestibular disorders. *Eur Arch Otorhinolaryngol*. 2022;279(11):5173–5179. doi: 10.1007/s00405-022-07366-y. Epub 2022 Apr 18. PMID: 35434778; PMCID: PMC9519666.
4. Rabin R, de Charro F. EQ-5D: a measure of health status from the EuroQol Group. *Ann Med*. 2001;33(5):337 – 43. doi: 10.3109/07853890109002087. PMID: 11491192.
5. Teh CS, Prepageran N. The impact of disease duration in persistent postural-perceptual dizziness (PPPD) on the quality of life, dizziness handicap and mental health. *J Vestib Res*. 2022;32(4):373–380. doi: 10.3233/VES-210087. PMID: 34924408.
6. Zamyslowska-Szmytko E, Politanski P, Jozefowicz-Korczynska M. Dizziness Handicap Inventory in Clinical Evaluation of Dizzy Patients. *Int J Environ Res Public Health*. 2021;18(5):2210. doi: 10.3390/ijerph18052210. PMID: 33668099; PMCID: PMC7956648.
7. Strupp M, Bisdorff A, Furman J, Hornibrook J, Jahn K, Maire R, Newman-Toker D, Magnusson M. Acute unilateral vestibulopathy/vestibular neuritis: Diagnostic criteria. *J Vestib Res*. 2022;32(5):389–406. doi: 10.3233/VES-220201. PMID: 35723133; PMCID: PMC9661346.
8. Lopez-Escamez JA, Carey J, Chung WH, Goebel JA, Magnusson M, Mandalà M, Newman-Toker DE, Strupp M, Suzuki M, Trabalzini F, Bisdorff A; Classification Committee of the Bárány Society; Japan Society for Equilibrium Research; European Academy of Otolaryngology and Neurotology (EAONO); Equilibrium Committee of the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS); Korean Balance Society. Diagnostic criteria for Menière's disease. *J Vestib Res*. 2015;25(1):1–7. doi: 10.3233/VES-150549. PMID: 25882471
9. Lempert T, Olesen J, Furman J, Waterston J, Seemungal B, Carey J, Bisdorff A, Versino M, Evers S, Newman-Toker D. Vestibular migraine: diagnostic criteria. *J Vestib Res*. 2012;22(4):167 – 72. doi: 10.3233/VES-2012-0453. PMID: 23142830.
10. Strupp M, Kim JS, Murofushi T, Straumann D, Jen JC, Rosengren SM, Della Santina CC, Kingma H. Bilateral vestibulopathy: Diagnostic criteria Consensus document of the Classification Committee of the Bárány Society. *J Vestib Res*. 2017;27(4):177–189. doi: 10.3233/VES-170619. Erratum in: *J Vestib Res*. 2023;33(1):87. PMID: 29081426; PMCID: PMC9249284.
11. Staab JP, Eckhardt-Henn A, Horii A, Jacob R, Strupp M, Brandt T, Bronstein A. Diagnostic criteria for persistent postural-perceptual dizziness (PPPD): Consensus document of the committee for the Classification of Vestibular Disorders of the Bárány Society. *J Vestib Res*. 2017;27(4):191–208. doi: 10.3233/VES-170622. PMID: 29036855; PMCID: PMC9249299.
12. von Brevern M, Bertholon P, Brandt T, Fife T, Imai T, Nuti D, Newman-Toker D. Benign paroxysmal positional vertigo: Diagnostic criteria. *J Vestib Res*. 2015;25(3–4):105 – 17. doi: 10.3233/VES-150553. PMID: 26756126.
13. Comolli L, Korda A, Zamaro E, Wagner F, Sauter TC, Caversaccio MD, Nikles F, Jung S, Mantokoudis G. Vestibular syndromes, diagnosis and diagnostic errors in patients with dizziness presenting to the

- emergency department: a cross-sectional study. *BMJ Open*. 2023;13(3):e064057. doi: 10.1136/bmjopen-2022-064057. PMID: 36963793; PMCID: PMC10040076.
14. Anderson JP, Harris JP. Impact of Ménière's disease on quality of life. *Otol Neurotol*. 2001;22(6):888 – 94. doi: 10.1097/00129492-200111000-00030. PMID: 11698814.
15. Ak AK, Çelebisoy N, Özdemir HN, Gökçay F. Vestibular migraine and persistent postural perceptual dizziness: Handicap, emotional comorbidities, quality of life and personality traits. *Clin Neurol Neurosurg*. 2022;221:107409. doi: 10.1016/j.clineuro.2022.107409. Epub 2022 Aug 5. PMID: 35961229.
16. Molnár A, Maihoub S, Mavrogeni P, Tamás L, Szirmai Á. Depression scores and quality of life of vertiginous patients, suffering from different vestibular disorders. *Eur Arch Otorhinolaryngol*. 2022;279(11):5173–5179. doi: 10.1007/s00405-022-07366-y. Epub 2022 Apr 18. PMID: 35434778; PMCID: PMC9519666.
17. Agrawal Y, Ward BK, Minor LB. Vestibular dysfunction: prevalence, impact and need for targeted treatment. *J Vestib Res*. 2013;23(3):113–7. doi: 10.3233/VES-130498. PMID: 24177344; PMCID: PMC4069154.

Declarations

Financial Disclosures: None

Conflicts of Interest: None

Author Contributions:

AGR: Study design, acquisition of data, data analysis, manuscript preparation

JR: Study design, acquisition of data, data analysis, manuscript preparation

IF: Study design, acquisition of data

SV: Study design, acquisition of data

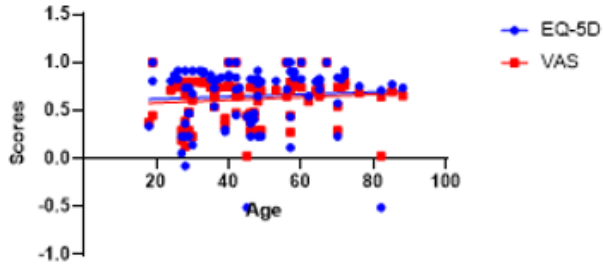
JVM: Study design, data analysis, manuscript preparation

MCB: Study design, acquisition of data, data analysis, manuscript preparation

JM: Study design, acquisition of data, data analysis, manuscript preparation

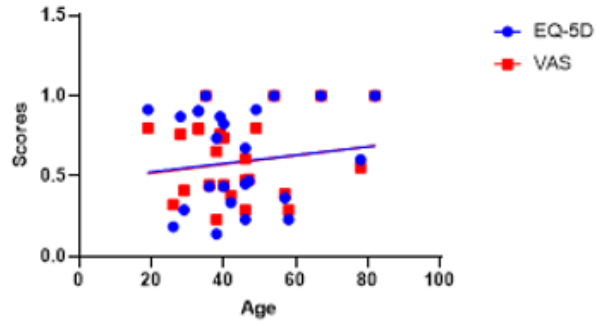
Figures

QoL Scores in Females with Vestibular Disorders (n=90)



P= 0.47
R= 0.009

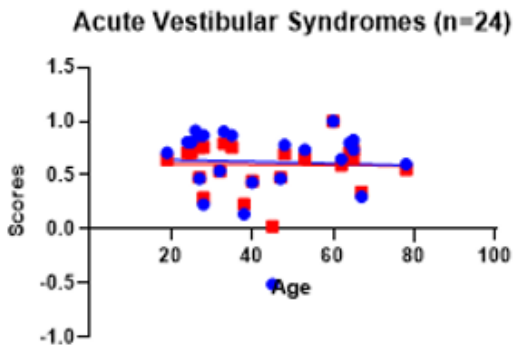
QoL Scores in Males with Vestibular Disorders (n=30)



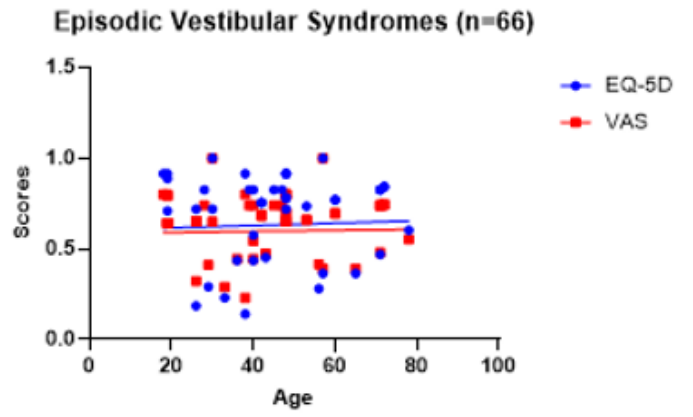
P= 0.30
R= 0.061

Figure 1

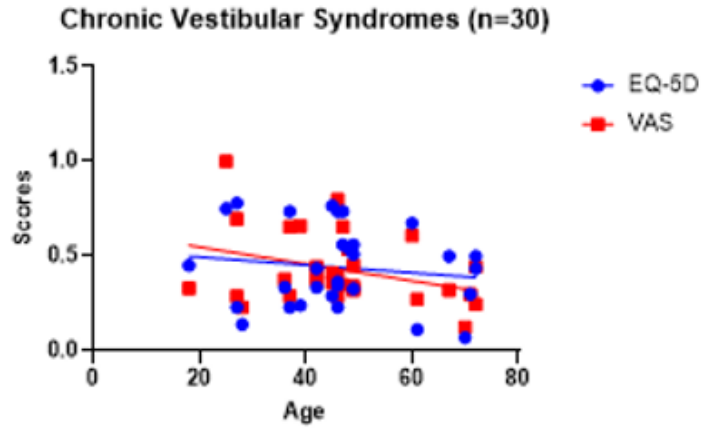
QoL scores using EQ-5D in females and males with vestibular disorders.



P= 0.07
R= 0.62



P= 0.40
R= 0.68

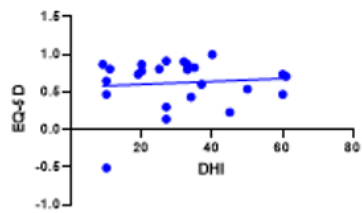


P= 0.02
R= 0.74

Figure 2

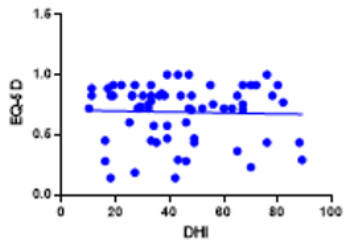
EQ-5D and VAS scores and vestibular syndromes

Acute Vestibular Syndrome DHI Score vs EQ-5D (n=24)



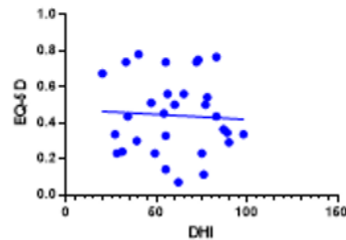
P= 0.235
R= 0.06

Episodic Vestibular Syndromes DHI vs EQ-5D (n=66)



P= 0.001
R= 0.06

Chronic Vestibular Syndromes DHI vs EQ-5D (n=30)



P= 0.02
R= 0.14

Figure 3

Dizziness Handicap Inventory Scores and EQ-5D and vestibular syndromes