

## Subscales of the Vestibular Activities and Participation questionnaire could be applied across cultures

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### Abstract

**Objectives:** The objective of this study was to assess the objectivity, cross-cultural validity, and convergent validity of the Vestibular Activities and Participation (VAP) questionnaire among four countries, Germany, United States, Jordan, and Saudi Arabia.

**Study Design and Setting:** This was a cross-sectional study conducted in four specialized outpatient dizziness clinics in Germany, United States, Jordan, and Saudi Arabia.

**Results:** A total of 453 participants were included in the study. The Rasch analysis revealed two separate subscales. Subscale 1 items included focusing attention, lying down, standing, bending, lifting and carrying objects, and sports. Subscale 2 items included walking long distances, climbing, running, moving around within buildings other than home, using transportation, and driving. The Pearson product–moment correlation between the Dizziness Handicap Inventory and the summary score of the VAP subscale 1 was 0.66 and was 0.64 for subscale 2.

**Conclusion:** Owing to its shortness and intercultural adaptability, the new two-scale version of the VAP questionnaire lends itself to clinical practice and research across countries to estimate the effect of vertigo and dizziness on activity limitation and participation restrictions. Psychometrically sound summary scores can be calculated. More extended versions of the VAP can be used for comprehensive clinical assessment where summary scores are not needed or a more detailed documentation is warranted. © 2015 Elsevier Inc. All rights reserved.

**Keywords:** Vertigo; Dizziness; Quality of life; Activities of daily living; Social participation; ICF

### 1. Introduction

Vestibular disorders are disabling conditions that can have a major effect on functioning, especially on daily activities and social participation [1–3]. Although the

disabling effect of vertigo is obvious, the full extent and specific nature of limitations and restrictions in activities and participation are largely unknown. In part, this may be due to the deficits of existing condition-specific measures [4].

Recognizing this potential gap, the Vestibular Activities and Participation (VAP) measure was recently proposed as an outcome measure resulting in a summary score [5]. The VAP was conceptualized by using salient categories of the International Classification of Functioning, Disability and Health (ICF). The ICF describes functioning as a dynamic interaction among its bodily, individual, and societal components in relation to a given health condition and relevant

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### What is new?

#### Key findings

- To fulfill the requirements of objective and cultural invariant measurement, the Vestibular Activities and Participation (VAP) measure has to be shortened and divided into two subscales. Some categories have to be rescaled. With the resulting new version, it is possible to obtain interval-scaled summary scores to assess activity limitations and participation restrictions in vestibular disorders and compare the findings across countries.

#### What this adds to what was known?

- The original version of the VAP is a carefully tailored measure to draw a comprehensive picture of activity limitations and participation restrictions in clinical use. The new two-scale version allows objective measurement and parametric operations of these limitations and restrictions.

#### What is the implication and what should change now?

- The new two-scale version of the VAP is useful for research purposes; however, its feasibility in clinical practice has to be proven. Future research should examine the cross-cultural validity of the VAP in other countries.

contextual factors [6]. From the patient's perspective, the individual and societal components of functioning, the component "Activities and Participation," appear to be the most relevant components. VAP consists of 34 items from ICF's Activities and Participation component and was developed through a literature review and an iterative Delphi process involving clinical experts. The VAP showed excellent results of reliability as well as concurrent and convergent validity in an ambulatory care setting [5]. However, specific objectivity of the VAP was not evaluated so far. For both clinical and research purposes, specific objectivity of an outcome measure is the most relevant property. The basic assumption of specific objectivity is that an easy item is more likely to be passed, or completed, than a difficult item, and that a person with high ability is more likely to pass an item than a person with low ability. Specific objectivity also means that the single summary score is able to measure the underlying trait of the person and that this score is valid irrespective of the abilities of the observed population and the difficulty of the items. Also, by testing specific objectivity, redundant items can be identified, that is, items that do not contribute to the knowledge about

the person's abilities, and can easily be dropped, thus leading to a more parsimonious scale.

Once developed, an outcome measure is likely to be adapted for other languages and cultures. In times of increasing globalization and technology transfer, data need to be pooled and compared across countries. Nevertheless, transfer of outcome measures between countries and cultures is challenging [7,8]. Cross-cultural applicability of a measure is not only an issue of correct translation. The modern psychometric approach evaluating specific objectivity can be operationalized for evaluating cross-cultural applicability by investigating invariance of the measure with regard to the cultural context. Here, invariance means that two persons with the same level of the trait being measured should score the same, irrespective of the country of origin. Only then will different adaptations of a measure provide data that can be compared or even pooled. Comparisons across countries are specifically interesting if the cultural differences are large, as between Western and Arab countries.

The objective of this study was to assess the specific objectivity with an emphasis on cross-cultural validity of the VAP questionnaire. Specifically we aimed to

1. Assess dimensionality and fit of the VAP items to justify a single summary score
2. Investigate the potential for shortening the scale
3. Assess cross-cultural adaptability
4. Assess convergent validity of the resulting scale by comparing it with a standard measure frequently used in vestibular disorders.

## 2. Methods

### 2.1. Study design and sample

The study was a multicenter cross-sectional study with four different centers on three different continents, including patients from the United States (Pittsburgh), Germany (Munich), Jordan (Amman), and Saudi Arabia (Riyadh).

Individuals with vestibular disorders aged 18 years and older who had adequate command of the language of the respective country and provided informed consent were included in the study between March and November 2013. Individuals were excluded if they were unable to complete the questionnaire because of cognitive barriers or if an acute medical condition was associated with dizziness and required immediate attention (eg, acute myocardial infarction or stroke). Participants were asked to complete the VAP during their initial visit to the University of Pittsburgh Medical Centers Balance and Vestibular Clinic (United States), the outpatient dizziness clinic at the German Center for Vertigo and Balance Disorders at Ludwig-Maximilians-Universität in Munich (Germany), the Middle East Center for Hearing and Balance in Amman (Jordan), and the Audiology and Balance Unit at King Abdulaziz University Hospital in Riyadh (Saudi Arabia). The study was given ethical approval by the institutional review boards of the respective institutions.

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