PSYCHIATRIC SYMPTOMS IN VERTIGO PATIENTS

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ACADEMIC DISSERTATION
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9 REFERENCES

10 ORIGINAL PUBLICATIONS
ORIGINAL PUBLICATIONS

This thesis is based on the following original articles referred to in the text by their Roman numerals:

I  Ketola S, Levo H, Rasku J, Pyykkö I, Kentala E
The sense of coherence in patients with Ménière’s disease
Auris Nasus Larynx 2014; 41(3): 244-248

II  Ketola S, Havia M, Appelberg B, Kentala E
Depressive symptoms underestimated in vertiginous patients
Otolaryngol Head Neck Surg. 2007; 137:312-315

III  Ketola S, Havia M, Appelberg B, Kentala E
Psychiatric symptoms in vertiginous patients
Submitted

Somatoform disorder in vertiginous children and adolescents

The publishers of the original articles have kindly granted their permission to reprint the papers in this thesis.
ABBREVIATIONS

AT  Autogenic training
BDI  Beck Depression Inventory
BPPV  Benign paroxysmal positional vertigo
CIS  The Clinical Interview Schedule
DIP-Q  The DSM-IV and ICD-10 Personality Questionnaire
DSM  The Diagnostic and Statistical Manual of Mental Disorders
DSM-III  The Diagnostic and Statistical Manual of Mental Disorders, 3th edition
DSM-III-R  The Diagnostic and Statistical Manual of Mental Disorders, 3th edition, Revised
DSM-IV  The Diagnostic and Statistical Manual of Mental Disorders, 4th edition
DSM-IV-TR  The Diagnostic and Statistical Manual of Mental Disorders, 4th edition, Text Revision
DSM-5  The Diagnostic and Statistical Manual of Mental Disorders, 5th edition
EQ-5D  Enriched EuroQol
FMF  Finnish Ménière’s Federation
GAF  The Global Assessment of Functioning Scale
HAD (S)  The Hospital Anxiety and Depression Scale
ICD-10  The International Statistical Classification of Diseases and Related Health Problems, 10th edition
MD  Ménière’s disease
ONE  Otoneurology expert system
PD  Personality Disorder
PROQSY  The Programmable Questionnaire System
RAP  Recurrent abdominal pain
RSE  Rosenberg’s Self-Esteem Scale
SAS  The Zung Anxiety Scale
SCL-90  The Symptom Checklist 90
SOC  Sense of Coherence
SPSS  Statistical Package for the Social Sciences
SSPI  The Semi-standardized Psychiatric Interview
SSRI  Selective Serotonin Reuptake Inhibitor
SSSI  The Social Stress and Support Interview Schedule
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>SSQ</td>
<td>The Social Support Questionnaire</td>
</tr>
<tr>
<td>STAI-T</td>
<td>Spielberg's State-Trait Anxiety Inventory-Trait Scale</td>
</tr>
<tr>
<td>TTO</td>
<td>Time grade off</td>
</tr>
<tr>
<td>VAS</td>
<td>The Visual analog scale</td>
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<tr>
<td>VBRT</td>
<td>Vestibular and balance therapy</td>
</tr>
<tr>
<td>VHQ</td>
<td>The Vertigo Handicap Questionnaire</td>
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<tr>
<td>VSS</td>
<td>The Visual Scale Score</td>
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ABSTRACT

Vertigo and dizziness are among the most frequent complaints in primary care. The symptoms are usually self-limited, and the clinical course is benign, with full recovery. In many cases, however, vertigo and dizzy spells recur, leading to impairment and chronic outcome.

A number of studies have documented a high prevalence of psychiatric comorbidity in vertiginous patients. Vertigo and dizzy symptoms themselves can provoke psychological distress, because recurrent unpredictable attacks can induce fear of losing control, concern of serious illness, and worry about severe attacks compromising one’s ability to adapt. Recurrent spells can also provoke earlier mental problems. Yet the degree of subjective handicap and emotional distress has shown no close relationship to measures of vertigo symptom severity. Psychiatric disorders do not cause vertigo or dizziness, but can, together with vertigo and dizzy symptoms, lead to persistent complaints. Anxiety and depression are the most common disorders associated with vertigo and dizziness.

Vertigo and dizziness in children is not rare. One population-based study found a prevalence of vertigo of 14% (Russell and Abu-Arafeh 1999). The etiology varies, but usually involves organic causes. Psychiatric etiology is investigated only after the exclusion of organic etiology. Psychosomatic symptoms are common in children and adolescents, often reflecting problems in psychosocial background.

The first study aimed to evaluate the adapting ability of patients with Ménière’s disease based on the sense of coherence scale. Data were collected with two different postal questionnaires involving 547 recipients (Study I). Studies II and III evaluated the prevalence of psychiatric symptoms in vertiginous patients. This study group comprised 100 vertiginous subjects from a randomly selected community sample participating in a vertigo prevalence study in the Helsinki University Hospital district. The investigative program entailed a neuro-otological examination and psychiatric evaluation in questionnaire form. Study IV assessed the prevalence of psychiatric disorders in a group of 119 children and adolescents between the ages of 7 months to 17 years who had visited the ear, nose and throat clinic with a primary complaint of vertigo. An otologist and a psychiatrist reviewed and evaluated each patient’s detailed medical history.

The results indicate a high sense of coherence (SOC) to represent deeper contentment in life and less psychological distress despite the chronic disease. Although SOC scores did not relate to the severity of illness, subjects with low SOC scores exhibited more symptoms of both
vertigo and psychological distress (Study I) than did subjects with high SOC scores. In Studies II and III, the prevalence of depressiveness was 19%, and the prevalence of symptoms of anxiety, 12%. A total of 68% of subjects reported psychiatric symptoms, the most common of which was personality disorder. Comorbidity between depressive, anxiety and personality symptoms were ample and related significantly to reduced functional capacity. In Study IV, the prevalence of psychogenic vertigo was 8%. Major depression was the most common disorder, and 2.5% of patients suffered from somatization disorder. The psychiatric distress commonly reflected psychosocial problems and affected seriously on daily life functioning.

In conclusion, this study found that psychiatric symptoms are common in vertiginous patients. Comorbidity may lead to a more debilitating course of vertigo independently of an organic cause or the severity of vertigo symptoms. Feelings of disability correlated with psychological distress. In children and adolescents, vertigo symptoms with compromised daily functioning, together with psychosocial stress factors, should invoke at least the possibility of psychiatric distress.

Keywords: vertigo, depression, anxiety, personality disorder, comorbidity, disability, coping, chronic
Huimaus on tavallisimpia vaivoja perusterveydenhuollossa. Oireena huimaus on yleensä ohimenevää ja itsestään parantuva, mutta joskus toistuvaa kohtauksellinen huimaus voi johtaa toimintakyvyn laskuun ja krooniseen taudinkuvaan.


Tutkimustulosten mukaan (tutkimus I) korkea koherentissintunne liittyi parempaan tyttöväisyteen elämäässä ja vähäisempään psykistä stressiin kroonisesta sairaudesta huolimatta. Vaikka koherentissintunne ei korreloinut sairauden vakavuuteen, ilmoittivat matalan koherentissintunten henkilöt korkean koherentissitunten henkilöitä enemmän sekä
sairauden oireita että psyykkistä stressiä. Tutkimuksissa II ja III masennusoireiden esiintyvyys oli 19% ja ahdistuksen 12%. 68%:lla tutkituista oli psyykkisiä oireita, joista persoonallisuushäiriö- oireet olivat yleisimmät. Masennus-, ahdistus- ja poikkeavien persoonallisuuspiirteiden välillä oli huomattavaa komorbiditeettia, mikä vaikutti huimauspotilaiden toimintakykyä laskevasti. IV tutkimuksessa 8%:lla tutkituista todettiin psykogeeninen huimaus, joista masennus-diagnoosi oli yleisin. 2.5%:lla potilaista todettiin somatisaatiohäiriö. Psyykkisen oireilun taustalla oli usein psykososiaalista stressiä ja arkisen toimintakyvyn laskua.

Tämän tutkimuksen perusteella psyykkiset oireet ovat yleisiä huimauspotilailla ja ne voivat johtaa toimintakyvyn laskuun huimusoireiden vakavudesta ja huimausdiagnoosista riippumatta. Psyykkisten oireitten esiintyvyys oli 68% huimauspotilasaineistossa. Lapsilla ja nuorilla huimusoireet yhdessä toimintakyvyn laskun ja psykososiaalisten ongelmien kanssa voivat viitata psyykkiseen syyhyn.

Avainsanat: huimaus, depressio, ahdistus, persoonallisuushäiriö, komorbiditeetti, toimintakyvyn lasku, sopeutuminen, krooninen
1 INTRODUCTION

Vertigo and dizziness are among the most common symptoms leading to consultation in primary care. The prevalence of vertigo or dizziness in the general population ranges from 20% to 30%. Symptoms of vertigo usually arise suddenly, but subside in due course following normal central compensation. In many cases, however, vertigo recurs leading to impairment and chronicity (Neuhauser 2007).

Psychiatric symptoms are common in vertiginous patients. In fact, the sudden onset of vertigo may trigger the onset of psychiatric symptoms or disorder (Godemann et al. 2005). Although the risk for psychiatric disorder is higher in patients with previous mental problems, previously mentally healthy individuals can also develop psychiatric symptoms. Psychological factors play a significant role in morbidity, especially in the chronic phase of vertigo (Best et al. 2009). Vertigo co-occurring with psychiatric disorder appears to lead to a more disabling course than in patients without mental symptoms, regardless of the original cause of vertigo (Sullivan et al. 1993). In neurotological testing, the subjective symptom severity in vertiginous patients shows no correlation with deficits (Best et al. 2006). Symptoms of depression and anxiety are the most common psychiatric problems linked to vertigo, but some studies indicate higher rates of personality disorders in vertiginous patients than in the normal population (Brandt 1996, Godemann et al. 2004).

Vertigo in children is rather common (Niemensivu et al. 2006). The differential diagnosis of vertiginous children is challenging due to their developmental level. Vertigo of organic etiology is the most common, and diagnosis will investigate psychiatric causes only after excluding other causes (Niemensivu et al. 2005). Children often develop somatic symptoms under psychological distress. Common somatic symptoms include aches, pains, tiredness, and dizziness (Craig et al. 2002). Somatization with normal daily functioning in children and adolescents seems rather common. However, severe impairment of functioning and multiple somatic symptoms may conceal a more serious psychosomatic or psychiatric disorder than would normal feelings of distress (Pollack et al. 2001).

Vertigo as a recurrent symptom compromises an individual’s capacity to cope. An individual’s attitude toward illness is one of the key elements in determining his or her ability to cope with it (Stanton et al. 2007). One’s ability to cope or adapt reflects his or her capacity
to deal successfully with different limitations, restrictions, and life stressors, all of which interact dynamically with the individual’s health and quality of life (Jacob and Furman 2001).

This work aimed to evaluate the prevalence of psychiatric symptoms in vertiginous patients and to assess underlying factors, such as attitudes and expectations towards vertigo, that cause limitations and restrictions in a chronic state of vertigo.

2 REVIEW OF THE LITERATURE

2.1 Vertigo

The Hearing and Equilibrium Committee of the American Academy of Otolaryngology – Head and Neck Surgery (1995) defines vertigo as “a sensation of motion when no motion is occurring relative to earth’s gravity.” Despite this definition, the nomenclature for dizziness or vertigo is inconsistent. In the literature, dizziness comprises all kinds of non-rotatory symptoms, but true vertigo is usually rotatory and of vestibular origin (Neuhauser 2007, Dros et al. 2011). The widely used division of dizziness proposed by Drachman and Hart (1972) defines four subtypes according to etiology: vertigo (etiology mainly of the ear, nose and throat as well as of neurological conditions), disequilibrium (due to orthopedic, neurological or sensory problems), presyncope (cardiac and vasomotor disorders), and atypical dizziness (mainly of psychiatric origin), but guidelines on definitions still vary. In this work vertigo denotes true vertigo.

Symptoms of vertigo arise from various sensory and sensorimotor systems. In true vertigo, benign paroxysmal positioning vertigo (BPPV), Ménière’s disease, vestibular neuronitis, and labyrinthitis are the most common disorders (Strupp and Bradt 2008, Post and Dickerson 2010).

The prevalence of dizziness/vertigo varies from 2% in young adults to 30% in older primary-care patients (Yardley et al. 1998, Dros et al. 2011). The lifetime prevalence of true vertigo in patients aged 18-70 years is 7.4% (Neuhauser 2007). In general practice, vertigo accounts for 10.7 visits per 1000 persons (Hanley and O’Dowd 2002), but approximately 40% of vertiginous patients fail to receive medical care despite the considerable impact of vertigo on
their everyday life (Yardley et al. 1998). Only one in ten vertiginous patients from primary care is referred to a specialist (Sloane 1989).

2.1.1 Ménière’s disease

The diagnosis of Ménière’s disease (MD) is based on a triad of symptoms: episodic vertigo, hearing loss, and tinnitus (Beasley and Jones 1996). Although the etiology of this condition remains unknown, symptoms occur due to periodic labyrinthine endolymphatic hydrops (Strupp and Brandt 2008). A study by Havia et al. (2005) found that the prevalence of MD in the Finnish population was 513/100 000, and the lifetime prevalence, 0.5% (Neuhauser 2007). MD usually affects middle-aged persons, and the course of the disease varies considerably. The disease usually begins on one side, but in 50% of cases becomes bilateral later on (Takumida et al. 2006). Vertigo spells may come at changing intervals ranging from few minutes to hours. In some individuals, repeated attacks continue, leading to permanent loss of hearing even though vertigo may have ceased. No specific test for MD is available; diagnosis is based on patient history and an audiogram (da Costa et al. 2002).

2.2 Anxiety and mood disorders

The Diagnostic and Statistical Manual of Mental Disorders (DSM) has served as the diagnostic standard in research since the broad acceptance of the DSM-III. The revised version of the DSM-III (DSM-III-R) ushered in significant changes to diagnostic criteria, followed by minor changes in the DSM-IV (American Psychiatric Association 1994) and DSM-IV-TR (American Psychiatric Association 2000) versions. This thesis used the 4th edition, Text Revision (DSM-IV-TR). According to the DSM-IV-TR, mood disorders include depression, bipolar disorder, dysthymia, and cyclothymia. This study includes only depression. Anxiety disorders and personality disorders are their own entities in the DSM-IV-TR. The newest version of the Diagnostic and Statistical Manual of Mental Disorders DSM-5 was released in 2013 (American Psychiatric Association 2013). The diagnostic criteria for the core symptoms of depression and anxiety have remained unchanged.

According to the DSM-IV-TR, psychiatric assessment includes diagnostic evaluation on five different levels or axes. Axis I represents diagnoses of major clinical concern, such as mood and anxiety disorders, substance-related disorders, schizophrenia, psychotic disorders and learning disorders. Personality disorders and mental retardation are coded on Axis II. Axis III
consists of somatic disorders and illnesses accompanying mental disorder. Axis IV indicates factors associated with or contributing to the current psychiatric disorder, such as financial problems, lack of social support, or educational or occupational problems. Axis V comprises the GAF scale (Global Assessment of Functioning), which measures patient’s level of functioning at a given time. Axial diagnosis provides a picture of what influences on patient’s psychiatric condition. Many psychiatric patients have diagnoses on several axes, thus leading to greater incapacitation and interference with treatment outcome (Lenzenweger et al. 2007). The latest version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) no longer uses a multiaxial system of diagnosis (American Psychiatric Association 2013).

### 2.2.1 Anxiety

Anxiety is a normal physiological mechanism for alerting a person to a danger and or threat, entailing diffuse and vague sense of nervousness and tension combined with autonomic arousal. In anxiety disorder, this sense of apprehension becomes ongoing, intense, and chronic, resulting in social and psychological impairment. Anxiety as a disorder may be linked to specific situations (specific phobic conditions, social phobia), presents as recurrent attacks (panic disorder), or manifest as more or less constant worry (generalized anxiety) (American Psychiatric Association 2000).

Anxiety disorders are the most common psychiatric disorders, occurring twice as often as depression. According to the National Comorbidity Survey, the 12-month prevalence for anxiety disorders in the United States was 18%, and the lifetime prevalence 29% (Kessler et al. 2005); European studies indicate prevalence rates of 6% and 14%, respectively (Alonso et al. 2004). In Health 2000, a Finnish population-based study, 5% of subjects interviewed met the criteria for anxiety disorder (Pirkola et al. 2005). The most common specific anxiety disorders in community samples have been specific phobia (9%), social phobia (7%), and post-traumatic stress disorder (4%) (Kessler et al. 2005).

The etiology of anxiety disorders constitutes a complex of genetic predisposition, negative emotionality, traumatic life events, and variables involving family, parenting, and environment (Muris 2001, Bandelow et al. 2013). Anxiousness is the most prevalent psychopathology among children and adolescents, and a significant proportion of childhood anxiety leads to persistent anxiety in adulthood (Rapee et al. 2009). Contrary to other psychiatric disorders, the highest rates of anxiety disorders occur in the relatively young.
Women are approximately twice as prone to anxiety as men (Murphy et al. 2004, Kessler et al. 2006).

Anxiety disorders are highly comorbid not only with each other, but also with other psychiatric disorders, especially depression. In a study of primary-care patients in Finland, anxiety disorders co-occurred with depression in 43% of subjects (Vuorilehto et al. 2005). Anxiety disorders can become chronic, affecting functional health status and causing greater limitations than either chronic depression or any somatic illness besides stroke (Surtees and Wainwright 2003). However, unlike with depression, most of the symptoms of anxiety are moderate to mild in clinical severity; the chronic, debilitating course correlates with comorbidity involving other psychiatric conditions (Kessler et al. 2005).

Most patients with symptoms of anxiety receive their initial treatment in primary care, where 12% of patients receive treatment for psychiatric conditions (Kyrios et al. 2011). Anxious patients rarely seek help for their mental problems. They usually attribute their symptoms to physical illness, especially if they have no previously diagnosed mental disorder, and therefore often fail to recognize their own psychiatric symptoms (Mojtabai et al. 2002). Unfortunately, many patients go undiagnosed or receive inadequate treatment in health care. According to the National Comorbidity Survey, most (96%) of the patients in the United States with panic disorder had received treatment at some point in their lifetime treatment history, but when restricted to the previous year, only 73% of patients received treatment, and only 55% of these received a currently acceptable level of medical care (Kessler et al. 2006).

Evidence-based treatment for anxiety disorders comprises pharmacotherapy and psychosocial treatment. Long-term cognitive-behavioral therapy in particular has proved its efficacy, but combining it with pharmacotherapy is even more effective and leads to clinical improvement (Roy-Byrne et al. 2010). The inappropriateness of medication and the inadequacy of administered doses, together with the lack of psychological treatment and patients prematurely dropping out of treatment, are the most common reasons for failure of response (Mojtabai et al. 2002, Kessler et al. 2006).

2.2.2 Depression

The core symptoms of depression include depressed mood and loss of interest or pleasure, lasting at least two weeks and interfering with normal functioning at work and in daily life. Patients with depressed mood may also experience loss of appetite along with weight-loss, insomnia, hypersomnia, fatigue, feelings of worthlessness or guilt, deterioration in ability to
concentration, indecisiveness, and thoughts of death. The more criteria for depression one fulfills, the more severe is his or her state of current major depression (American Psychiatric Association 2000, Belmaker and Agam 2008).

The prevalence of depression varies due to clinical settings, target population, diagnostic criteria, and methods used in different investigations. The worldwide occurrence of an episode of depression in any given year is approximately 6% in men and 10% in women (Bebbington 1998, Kendler et al. 2002, Kendler et al. 2006a). Studies based on random population samples in Europe (Ayoso-Mateos et al. 2001) have shown an overall prevalence of depression of 9% for all, 10% for women, and 7% for men. The population prevalence rate for depressive episodes in Finland is 9%, and for women and men: 8.3% and 4.6%, respectively (Pirkola et al. 2005).

The etiology of depression is a mixture of genetic liability, childhood risk factors (disturbed family environment, childhood sexual abuse, parental loss), predisposing personality traits, and adverse life events (Kendler et al. 2004, Kendler et al. 2006b). Many social risk factors, including low social support, unemployment, marital difficulties, and substance abuse, are consistent for depression across different cultures (Lindeman et al. 2000, Kendler et al. 2002, Pirkola et al. 2005, Kendler et al. 2006b). Early-onset anxiety disorder and neuroticism as a predominant personality dimension, together with stressful life events, renders sensitive individuals vulnerable to depressive mood. The personality trait for neuroticism (i.e. negative affectivity and proneness to anxiety) is genetically moderated (Kendler et al. 1995, Kendler et al. 2004). The female predominance in depression disorders tends to decline with age, and sex differences even out after the age of 55 due to a drop in female rates (Bebbington 1998).

Periods of depressed mood vary greatly, frequently recur, and become often chronic (Gilmer et al. 2005, Vuorilehto et al. 2005). In particular, older age, a low level of education, and lower income are all risk factors for chronicity. Neuroticism or neuroticism-like traits, together with prior depressive episodes and stressful life events, predict future periods of major depression (Kendler et al. 2002). In a sample of primary health care patients in Finland, 47% of patients with chronic depressive symptoms also suffered from chronic somatic disease (Vuorilehto et al. 2005). The burden of somatic disease, combined with depressed mood, leads to more profound loss of function and wellbeing than do somatic diseases alone (Hays et al. 1995).

Depressive disorders are highly comorbid with other Axis I and Axis II disorders. A study (Vuorilehto et al. 2005) of 137 patients in a sample of primary health care patients with a history of depression, nearly 88% had a current psychiatric comorbidity. Of Axis I disorders,
anxiety occurred in 56% and substance abuse in 33% of patients, whereas Axis II personality disorders occurred in 52% of subjects. Co-occurrence of Axis I and Axis II disorders associates with symptom severity and poorer treatment outcome (Kessler et al. 2005).

A minority of patients actively seeks help for their depressed mood. Only one third of depressed patients seeks or receives treatment from health services (Hämäläinen et al. 2008). Health care professionals are more likely to detect severely depressed patients than mildly or moderately depressed subjects. Many patients have coexisting somatic illnesses that may cause symptoms similar to depression, thus masking symptoms of depression (Katon et al. 1986, Hämäläinen et al. 2008). Primary care and occupational health services are the first places to identify possible psychological distress and depression. Approximately 10% of all patients in primary care show symptoms of clinical depression (Salokangas et al. 1996).

The main factors affecting choice of treatment are length of symptoms, symptom severity, psychiatric history, and possible psychiatric and somatic comorbidity. Antidepressive drugs have proved to be effective in all forms of depression, but the most effective treatment is pharmacotherapy combined with psychological therapy (Pampalona et al. 2004), including for patients with somatic comorbidity (Mohr et al. 2001).

2.3 Personality disorders

Personality disorders (PD) are rigid and pervasive patterns of behavior, which usually begin in adolescence or early adulthood. This maladaptive pattern affects interpersonal relationships, emotions, cognition, and impulse control in a way that leads to conflict with those nearby. Patients with PD seldom recognize their problems. When these maladaptive personality traits cause substantial distress and social or occupational impairment, the criteria for diagnosing personality disorder are fulfilled. PDs are coded on Axis II in DSM-IV-TR (American Psychiatric Association 2000).

According to evidence-based genetic investigations, the DSM-classification divides personality disorders into three groups: cluster A includes paranoid, schizoid and schizotypal personality disorders; cluster B, antisocial, borderline, histrionic and narcissistic ones; and cluster C, avoidant, dependent and obsessive-compulsive personality disorders. Subjects of cluster A personality have more psychotic disorders in their close relatives and usually exhibit peculiar or strange behavior. The behavior of Cluster B personalities is impulsive and dramatic. Cluster C personalities manifest as fearful and prone to anxiety (American
Psychiatric Association 2000). The etiology of different PDs is heterogeneous. Different sociodemographic features have also shown links to different PDs, but study results vary greatly (Lenzenweger et al. 2007).

Table 1. Prevalence (%) of personality disorders in different studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Samuels et al. 2002</th>
<th>Crawford et al. 2005</th>
<th>Torgersen et al. 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>Community (USA)</td>
<td>Community (USA)</td>
<td>Community (Norway)</td>
</tr>
<tr>
<td>Sample size</td>
<td>742</td>
<td>644</td>
<td>2053</td>
</tr>
<tr>
<td>Instrument</td>
<td>IPDE</td>
<td>IPDE</td>
<td>SIDP-R</td>
</tr>
<tr>
<td>Prevalence (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cluster A</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paranoid</td>
<td>0.7</td>
<td>5.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Schizoid</td>
<td>0.9</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Schizotypal</td>
<td>0.6</td>
<td>1.1</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Cluster B</strong></td>
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<tr>
<td>Antisocial</td>
<td>4.1</td>
<td>1.2</td>
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<tr>
<td>Borderline</td>
<td>0.5</td>
<td>3.9</td>
<td>0.7</td>
</tr>
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<td>Histrionic</td>
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<td>0.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Narcissistic</td>
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<td>2.2</td>
<td>0.8</td>
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<tr>
<td><strong>Cluster C</strong></td>
<td></td>
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<td></td>
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<tr>
<td>Avoidant</td>
<td>1.8</td>
<td>6.4</td>
<td>5.0</td>
</tr>
<tr>
<td>Dependent</td>
<td>0.1</td>
<td>0.8</td>
<td>1.5</td>
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<tr>
<td>Obsessive-Compulsive</td>
<td>0.9</td>
<td>4.7</td>
<td>2.0</td>
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<tr>
<td>Passive-Aggressive</td>
<td>0.0</td>
<td>0.0</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Any PD</strong></td>
<td>9.0</td>
<td>15.7</td>
<td>13.4</td>
</tr>
</tbody>
</table>

IPDE = International Personality Disorder Examination, based on DSM-IV and ICD-10 criteria
SIDP-R = Structured Interview for DSM-III-R Personality Disorders

The prevalence of personality disorders varies across different studies. In non-clinical samples in the United States, the prevalence of any PD ranges from 9% to 16% (Samuels et al. 2002, Crawford et al. 2005, Lenzenweger et al. 2007), whereas in European studies, the prevalence was 13% (Torgersen et al. 2001). A study by Lenzenweger et al. (2007) has identified avoidant (5%) as the most prevalent single PD, followed by schizoid (4.9%), and obsessive-compulsive (2%); a study by Torgersen et al. (2001), however, ranks them as follows: avoidant (5%), paranoid (2%), and histrionic and obsessive-compulsive (both 2%). Different personality disorders seemed to be highly concurrent; the mean number of PD diagnoses among those with PD was 1.5. In fact, of the responders with PD, 19% had
concurrent two PD diagnoses, 5% had three, and 3% had four different diagnoses of PD (Torgersen et al. 2001).

Personality disorders are common among psychiatric outpatients. Zimmerman et al. (2005) evaluated private practice patients with medical insurance upon presentation to psychotherapy with the Structured Interview for DSM-IV Personality (SIDP-IV). One third (31%) of the patients were diagnosed with one PD. The inclusion of personality disorders not otherwise specified raised the rate of any PD to 46%. Cluster C and avoidant personality were the most common PDs. A study by Vuorilehto et al. (2005) reached an identical result: 52% of the recipients in a sample of primary health care patients with depressed mood as their primary diagnoses also fulfilled the criteria for PD. The most frequent PDs were from Cluster C and avoidant personality.

As noted previously, personality disorders are highly comorbid with Axis I diagnoses; in fact, personality disorders are a risk factor for Axis I disorders such as depression and anxiety. On the other hand, Axis I disorders may accentuate maladaptive changes in personality traits. Comorbid personality disorder may account for most of the functional impairment and morbidity of Axis I disorders. Patients with schizotypal or borderline personality seem to have more impairment than do subjects with obsessive-compulsive, avoidant PDs, or major depression (Skodol et al. 2002).

For personality disorders, psychotherapy is generally the treatment of choice, but the clinical picture affects the recommended treatment. Evidence supports the efficacy of distinctive therapies targeting personality disorders, but patients who lack motivation for change or find it difficult to accept therapy may require other treatment regimen. Because comorbidity is common, treatment usually aims to relieve symptoms of depressed mood, anxiety or distortion of reality with medication. In treating symptoms such as impulsiveness, aggression and self-destructive behavior, specific medication may prove beneficial. Due to comorbidity, however, patients in psychiatric care usually require long, intensive, and multimodal therapies. Moreover, comorbidity may influence the outcome of treatment (Enns et al. 2001).
2.4 Psychiatric symptoms and somatic illnesses

2.4.1 Psychosomatic medicine
The psychosomatic model of medicine considers psychological factors important in medical disorders, as they can initiate, prolong, or aggravate somatic disease, or be a reaction to the illness. The susceptibility of a person to a psychosomatic reaction is a combination of genetic and acquired vulnerability (Sirri et al. 2013). In particular, factors such as stressful life events, chronic stress, personality trait, illness behavior, and perceived quality of life affect individual exposition. Psychological stress involved in medical illnesses may not be classified in psychiatric terms and diagnoses, but they nevertheless influence biological processes and somatic condition (Fava and Sonino 2005, Fava and Sonino 2010).

2.4.2 Anxiety symptoms
Anxiety frequently coexists in patients with somatic illness. The non-specific nature of anxiety symptoms challenges the clinical differential diagnosis from normal reaction to somatic disease from pathological anxiety. Normal anxiousness generally ensures adaptation and coping, while pathological anxiety can exacerbate symptoms and chronicity. The symptoms of autonomic arousal, linked to states of anxiety, resemble symptoms of medical illness, thus mimicking and possibly aggravating pre-existing medical conditions (Pollack et al. 2001).

Patients with asthma and other chronic lung diseases have shown higher rates of comorbidity with anxiousness and panic disorder as well as depression. The severity and recurrent episodes of acute life-threatening episodes and exacerbations of asthma multiplies the risk, leading to greater symptom burden, functional impairment, and health care utilization (Katon et al. 2004). Anxiety, especially panic attacks and symptoms of vestibular vertigo appear to share a bidirectional link, but this proposed link between balance control and the processing of emotional responses remains controversial. This bidirectional linkage may also link asthma and anxiety, as asthma symptoms provoke anxiety. Vice versa, asthma patients with anxiety or depression or both suffer from exacerbated asthma and report more symptoms of asthma (Kovalenko et al. 2001). Anxiety is a common symptom in vertiginous patients, and many patients with panic disorder experience dizziness in the acute phases of the panic attack. Anxiousness tends to arise in the acute phase of vertigo and subside with time, but those vulnerable to previous anxiety disorders experience high rates of reactivation (Best et al. 2009).
Patients with chronic tinnitus are exposed to continuous distress, leading to effects analogous to other chronic diseases, especially when they consider it annoying. The normal habituation process neutralizes neural activity in patients who can accept their symptoms, but in patients with more distress, negative reinforcement of tinnitus perception compromises habituation. This leads to debilitation and negative impact on their quality of life because no immediate cure is available. Anxiety and negative affectivity often underlie this phenomenon (Jastreboff et al. 1996, Malouff et al. 2011).

2.4.3 Depressive symptoms

Many medical conditions strongly associate with depression, and many etiological and biological factors influence links between comorbid depression and somatic illness.

Depression is a common comorbid disorder among patients with chronic diseases, including chronic back pain (Wang et al. 2010), rheumatoid arthritis (Dickens et al. 2002), and cancer (Brinzenhofe-Szoc et al. 2009). A literature review of disease clusters in older adults revealed depression as one of the five most common comorbidities, especially with hypertension, arthritis, diabetes, COPD/asthma, cancer, and heart disease (Sinnige et al. 2013). These illnesses comprise increasing disability, suffering, pain, and changes in one's social role, as well as life-threatening events leading to psychological distress and possible depression. Neurological diseases show even higher prevalence rates for depression than for other somatic illnesses (Thielscher et al. 2013). The lifetime risk for depression in multiple sclerosis patients ranges from 23% to 54%, with a special association with higher levels of disability and younger age of onset, but not with a remission of disease. In Parkinson's disease, the prevalence of depression ranges from 41% to 49%. Depressive symptoms often associate with longer duration of Parkinson's disease and prior history of depressive symptoms. But such symptoms, along with possible psychological reactions to the growing physical disability of Parkinson's disease, a direct expression of neuropathology may be likely (Farabaugh et al. 2009). Mood changes in neurological diseases may represent a reaction to disability and the unpredictability of the future, but may also involve biochemical and neuropathological changes (Robinson and Spaletta 2010).

In some somatic conditions, the relationship with depression is bidirectional, as in diabetes and coronary artery disease. Propensity to somatic and psychiatric concurrence may implicate the same risk factors, but neuroticism and low educational attainment also seem to concentrate in this population (Neeleman et al. 2001).
Patients with diabetes type 1 or 2 are at higher risk for depressive disorders (odds ratio 1.6-2.0) (Anderson et al. 2001). Depressive disorder itself may increase the risk for developing diabetes by lowering glucose intolerance, and thus raising blood glucose levels. This effect is partly due to lifestyle factors (Golden et al. 2008).

Evidence also implicates depression as an independent risk factor for the development of coronary heart disease, an association that is as strong as for conventional risk factors (serum cholesterol, hypertension, smoking) and associates directly with severity of depression. Acute emotional stress can precipitate cardiac events in high-risk patients, but in long-run chronic emotional stress may enhance the underlying pathophysiological process, leading to coronary heart disease (Denollet et al. 2000). In both diabetes and coronary artery disease, depressive symptoms are risk factors for worsening prognosis and direct mortality (Goldston and Baillie 2007, Katon 2008). Acute cardiac insult markedly amplifies the prevalence of depression, possibly due to one's psychologically reactive state to acute disease or mediated by increased inflammatory activity in the blood (Glassman et al. 2009). In cancer, a cytokine-induced biological effect on mood may also be possible (Brinzenhofs-Szoc 2009).

Comorbid physical illness influences the symptoms patients present in primary care. Depressive symptoms can affect the morbidity and mortality of a somatic condition by reducing the patient's adherence to treatment and commitment to following risk-reducing instructions. This phenomenon associates with many chronic illnesses, including diabetes (Gonzales et al. 2008), hypertension (Bogner and de Vries 2008), human immunodeficiency virus infection (Bing et al. 2001), and coronary artery disease (Goldston and Baillie 2008).

2.5 Psychiatric symptoms and vertigo

2.5.1 General
Psychiatric symptoms are common in vertiginous patients. Dysfunction of the equilibrium system usually arises suddenly, causing anxiousness and worry. Symptoms of vertigo usually subside with time, but dizziness may trigger the onset of psychiatric symptoms and illness (Godemann et al. 2005). Unexpected, uncontrollable vertigo spells, together with fear of losing control, may cause psychological distress (Yardley et al. 1992, Godemann et al. 2004). The risk for psychiatric disorder is higher in patients with previous mental disorders, but the formerly
mentally healthy may also develop psychiatric symptoms (Best et al. 2009). Psychiatric comorbidity associated with vertigo seems to lead to a more subjectively disabling combination than vertigo symptoms alone, regardless of the organic bases of vertigo (Sullivan et al. 1993). This holds true, even when compared with patients with severe neurological deficits (Pollak et al. 2003). Psychiatric comorbidity is a risk factor for chronic outcome and a great handicap in vertiginous patients (Eckhard-Henn et al. 2003, Garcia et al. 2003, Best et al. 2009).

Table 2. Occurrence of anxiety and depression in dizzy patients across different studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Patients (n)</th>
<th>Anxiety (%)</th>
<th>Depression (%)</th>
<th>Psychiatric morbidity (%)</th>
<th>Source of data</th>
<th>Psychiatric instruments</th>
<th>Mean duration of vertigo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eagger et al. 1992</td>
<td>54</td>
<td>41</td>
<td>38</td>
<td>50</td>
<td>Tertiary clinic</td>
<td>CIS, BDI, SSSI, The Fear Quest, STAI-T</td>
<td></td>
</tr>
<tr>
<td>Yardley et al. 1992</td>
<td>185</td>
<td>28</td>
<td>7</td>
<td></td>
<td>Tertiary clinic</td>
<td>VSS, VHQ, HAD, STAI-T</td>
<td></td>
</tr>
<tr>
<td>Yardley et al. 1998</td>
<td>37</td>
<td>49</td>
<td>46</td>
<td></td>
<td>Community sample</td>
<td>PROQSY</td>
<td></td>
</tr>
<tr>
<td>Garcia et al. 2003</td>
<td>52</td>
<td>27</td>
<td>7</td>
<td></td>
<td>Tertiary clinic</td>
<td>SSPI, BDI, The Fear Quest, the panic and mobility symp.quest.,STAI-T,SCL-90</td>
<td>2 yrs follow-up</td>
</tr>
<tr>
<td>Pollak et al. 2003</td>
<td>30</td>
<td>77</td>
<td>67</td>
<td></td>
<td>Tertiary clinic</td>
<td>HADS</td>
<td>&lt; 1 week</td>
</tr>
<tr>
<td>Grunfeldt et al. 2003</td>
<td>91</td>
<td>29</td>
<td>17</td>
<td></td>
<td>Tertiary clinic</td>
<td>VSS, HAD, SSQ, RSE</td>
<td>2.8 yrs</td>
</tr>
<tr>
<td>Eckhardt-Henn 2003</td>
<td>202</td>
<td>43</td>
<td>16</td>
<td>68</td>
<td>Tertiary</td>
<td>SCL-90, STAI, structured interview</td>
<td></td>
</tr>
</tbody>
</table>

CIS = Clinical Interview Schedule  
BDI = Beck Depression Inventory  
HAD(S) = Hospital Anxiety and Depression Scale  
PROQSY = Programmable Questionnaire System  
RSE = Rosenberg's Self-Esteem Scale  
SCL-90 = Symptom Checklist 90  
SSPI = Semi standardized Psychiatric Interview  
SSSI = Social Stress and Support Interview Schedule  
SSQ = Social Support Questionnaire  
STAI-T = Spielberg’s State-Trait Anxiety Inventory-Trait Scale  
VHQ = Vertigo Handicap Questionnaire  
VSS = Visual Scale Score
2.5.2 Anxiety symptoms and vertigo

Anxiety is a common symptom in patients suffering from balance problems. The prevalence of anxiety varies from 15% to 76% (Table 2, MacKenna et al. 1991, Sullivan et al. 1993). Patients have considered feelings of dizziness to be more anxiety-provoking sensation than other bodily symptoms (Asmundson et al. 1998). Most patients feel anxious at the onset of vertigo, but not all continue experiencing psychiatric symptoms. In a study by Best et al. (2009), anxiousness seemed to subside after the acute phase of vertigo, but patients with a history of psychiatric disorders were vulnerable to developing psychiatric problems such as anxiety or depression later.

The highest rates of coexistence reportedly occur between vestibular dysfunction and psychiatric symptoms with a prevalence of 30-50% (Eagger et al. 1992, Clark et al. 1994, Stein et al. 1994, Yardley et al. 1998, Eckhardt-Henn et al. 2003). Many patients with vestibular vertigo develop psychiatric symptoms in the course of their illness (Eagger et al. 1992, Clark et al. 1994, Eckhardt-Henn et al. 2008). In a study by Eckhardt-Henn et al. (2008) patients with vestibular migraine and MD showed higher psychiatric comorbidity, especially anxiety and depression, than did patients with vestibular neuronitis and benign paroxysmal positional vertigo. Factors other than vestibular deficit, such as previous psychiatric history and trait or state anxiety, appear to explain psychiatric morbidity (Eagger et al. 1992, Best et al. 2009).

Patients with chronic vertigo (i.e., persistent vertigo symptoms for one year or more) have shown marked comorbidity with psychiatric disorders despite the original organic bases of vertigo. Vestibular test results show no correlation with feelings of vertigo, but anxiety nevertheless seems to be a crucial factor in inducing a chronic outcome. However, Yardley et al. (1992) found no relationship between symptom severity, vertigo type and psychological distress. The severity of vestibular deficit and dysfunction showed no correlation with onset of secondary psychiatric symptoms (Eagger et al. 1992, Yardley et al. 1994, Godemann et al. 2005). Some researchers have suggested that patients experiencing sustained feelings of vertigo but lacking objective test results may be suffering from chronic subjective dizziness (CSD); psychogenic, non-organic vertigo; somatoform vertigo; or phobic postural vertigo (Brandt 1996, Staab et al. 2007, Odman and Maire 2008).
2.5.3 Panic symptoms and vertigo

The high prevalence of panic disorder in vertiginous patients has led to a presumption of functional relationship between vestibular and affective reactions. Eagar et al. (1992) found that 28% of patients with vertigo developed panic disorder. Some researchers have postulated that vertigo of vestibular origin in particular may trigger or cause anxiety and omit panic through a distinct neurological circuit, which links autonomic control, vestibulo-autonomic interaction, and emotional affect. Information from the vestibular apparatus is processed in the parabrachial nucleus, which has further connections to the amygdala, the infralimbic cortex, and the hypothalamus, which modulates emotional responses. Subclinical otoneurological abnormalities have been found in patients with panic disorder, but studies have reported minor changes in vestibular responses in healthy controls also. Due to repeated findings of normal vestibular test results with subjective ongoing vertigo, some researchers postulated that minor vestibular dysfunction may be a complicating factor in provoking panic disorder in vulnerable patients (Jacob et al. 1996, Staab 2000). Evidence indicates that catastrophic thoughts play a major role in causing panic attacks. Patients with panic disorder tend to react to and misinterpret changes in bodily sensations in a fearful and catastrophic manner (Casey et al. 2004). In a study by Godemann et al. (2005) at acute phase of vestibular neuronitis nearly all patients felt anxious and helpless, but only patients, whose anxiety sustained with preoccupation and fear of vertigo, developed panic or somatoform disorder later on.

The neurobiological system, which is vulnerable to anxiety, may remain stable until stressors of life disturb this homeostasis. These stressors can activate and maintain anxiety through maladaptive cognitions and avoidance responses (Stern et al. 2001). In vertiginous patients, however, symptoms of anxiety may aggravate symptoms of vertigo by amplifying autonomic arousal (Yardley and Redfern 2001, Staab 2006).

Panic disorder is frequently accompanied by avoidance of places or situations where symptoms of panic might or have already manifested. Negative beliefs about the illness can push one towards avoidance and restrictions in normal life (Yardley and Redfern 2001). This agoraphobic avoidance, together with the presence of vertigo and fainting, is the most disabling symptom of vertigo (Nazareth et al. 1999). Patients with panic disorder, together with agoraphobia, report more severe symptoms of vertigo and fainting, which lead to occupational disability when compared to patients with dizziness, but without panic disorder, or with panic disorder only (Yardley et al. 2001).
2.5.4 Depressiveness and vertigo

With a lifetime prevalence that varies from 16% to 67% (Table 2), depression is highly prevalent in vertiginous patients. Most prevalence studies have been conducted in tertiary clinics, thus implying select patient groups. Patients with diabetes (Boulanger et al. 2009) and cancer (Hotopf et al. 2002) have also shown a high prevalence of depression. In general, depression occurs in 6% to 14% of medical inpatients (Katon and Schurberg 1992).

Depression generally associates with a considerable subjective illness burden, compromised functional ability, and high mortality, but also with low quality of life and life satisfaction (Ferrari et al. 2010). When depression coexists with other medical illnesses, it increases health care utilization and costs, due to longer hospital stays, higher rates of hospitalization, and increased outpatient clinic utilization (Boulanger et al. 2009). Studies have shown that depression concurrent with vertigo associates with chronic outcome (Sullivan et al. 1993), loss of quality of life, low functional capacity and permanent symptoms of vertigo with no objective findings in neurotological tests and showing no correlation with severity of vertigo (Grunfeldt et al. 2003).

Unlike in anxiety, in depression, the reaction to acute situations comes with latency. In a one-year follow-up study of vertiginous patients with different organic causes of vertigo, patients showed a reactive tendency toward depression six weeks after the onset of vertigo. Vertigo may trigger depression, but somatic illness usually activates premorbid depression in vulnerable persons (Best et al. 2009).

Neuroticism or negative affectivity may explain one's receptivity to symptoms of depression due to vertigo. Negative affectivity denotes a tendency towards anxiety, inhibition and avoidance in social situations. Subjects with negative affectivity are prone to negative emotional experiences, which render them vulnerable to dysphoria, depressed mood, feelings of tension, and worry (Watson and Clark 1984). Depression, together with trait negative affectivity, is well studied in patients with coronary heart disease and diabetes, as it predicts poor compliance and health outcomes independent of other biomedical or psychological risk factors (Denollet et al. 2000, Martens et al. 2010). The onset of vertigo is usually sudden and unexpected causing patients great emotional stress. Feelings of losing control and the unpredictability of attacks fuel anxiety and worry, and even subtle symptoms of imbalance or dizziness can provoke alertness and tension. Prolonged distress can also lead to depression (Yardley et al. 1994).
Elderly persons in particular experience difficulties with psychosocial adjustment after acute illness, when it involves depression (de Jonge et al. 2004). Mechanisms that aid coping with somatic illness may be important. Depressive symptoms, such as low self-esteem, lack of initiative, and feelings of worthlessness, undermine coping mechanisms, such as high perceived level of control, higher self-efficacy, and active coping styles, all of which associate with better adjustment (Beltman et al. 2010).

Different study settings have enabled the detection of depression in vertiginous patients with different diagnoses of vertigo. The state of mood does not usually correlate with different diagnoses of vertigo or the severity of symptoms, with the exception of vestibular migraine and MD. In these forms of vertigo, the unpredictability of attacks, together with one’s long-term medical history, may explain the greater psychological strain and distress (Best et al. 2006, Echardt-Henn et al. 2008, Best et al. 2009).

### 2.5.5 Personality disorders and vertigo

Little is known about personality disorders and vertigo. Brandt has proposed a chronic form of vertigo known as phobic postural vertigo. Patients lack somatic signs of vertigo despite constant subjective feeling of unsteadiness. The personality of these patients is often obsessive-compulsive (Brandt 1996). Godeman et al. (2004) found dependent and obsessive-compulsive personalities in patients whose originally acute vestibular symptoms progressed to chronic feeling of vertigo with no association with vestibular lesion. These patients were significantly anxious at the onset of acute vestibular imbalance and tended to evaluate somatic symptoms fearfully.

The role of personality disorders in vertigo may be understood through susceptibility to anxiety. Personality disorders most often linked to vertiginous patients are obsessive-compulsive and dependent personalities, both of which belong according to the DSM-IV-TR under Cluster C personalities sharing anxious and fearful features (American Psychiatric Association 2000). In a two-year prospective study by Godemann et al. (2006), catastrophic thoughts, together with body-related fears, predicted 60% of variance in the development of panic disorder of somatoform vertigo. The anxiety trait failed to explain this sensitivity to dysfunctional automated thoughts, however, so researchers believe them to be relevant to various characteristics of personality disorders (e.g., dependent and insecure personality disorders).
Personality disorders associate with a chronic outcome of initially benign vertigo. They are not the cause of vertigo, but may, through maladaptive coping mechanisms, influence the course of the disease. Specific personality features, such as antisocial or borderline personality, may compromise a subject’s compliance with treatment, thus rendering them more prone to unhealthy behavior. They may also lack a stable social environment and motivation for a longer commitment to treatment due to affective instability (Nater et al. 2010). Patients with comorbid personality disorder may therefore require different treatment strategies (Rimes and Chalder 2005).

2.6 Psychiatric symptoms and somatic complaints among children

Symptoms of anxiety and depression are mutually comorbid with somatic complaints and medical illnesses in children and adolescents. Inexplicable functional somatic symptoms (i.e., symptoms with no organic basis) are a common manifestation of distress in children. Somatization and somatoform disorders usually underlie symptoms of depression, anxiety, and emotional problems (Carralda 2010). Highly somatizing patients are at high risk for developing major depression later on (Zwaigenbaum et al. 1999), along with a risk for personality disorder in adulthood (Bass et al. 1995).

Psychological distress may directly affect soma through stress reactions or awakening of the immune system, but the opposite is also possible: somatic symptoms can trigger or exacerbate existing emotional and affective symptoms (Chavira et al. 2008). In children and adolescents, differences in temperaments have associated with variance in biological and behavioral reactivity to stress, thus affecting a child’s vulnerability to medical symptoms (Boyce et al. 1992). Serious somatic illness in childhood, socioeconomic problems of caregivers, and former psychological trauma are risk factors for somatization (Hotopf et al. 1999, Stuart and Noyes 1999).

In a study of medically unexplained neurologic symptoms such as headache, vertigo, and seizures, nearly 90% of patients also had a comorbid psychiatric disorder; depression was the most common (Emiroglu et al. 2004). In a study by Masi et al. (2000), 70% of young patients in psychiatric care had somatic complaints along with their emotional and behavioral problems; headache and abdominal pain were the most frequent complaints. In particular, patients with anxiety and depression reported significantly higher rates of headache than did patients with other psychiatric disorders.
Emotional and affective problems accompanying chronic medical conditions affect self-care and treatment outcomes. In a study by Richardson et al. (2006), anxiety and depressive disorders correlated significantly with more intense symptoms of asthma in children and youth between 11 and 17 years of age. Asthma is the most common chronic disease of childhood and adolescence, but recurrent abdominal pain (RAP) is the most prevalent complaint in both community and clinical settings. Only 5% of RAP is of organic origin, yet nearly 30% to 50% of these subjects continue to experience abdominal pain in adulthood (Walker et al. 1995). In a sample of RAP patients, 67% of subjects fulfilled the criteria for anxiety disorder, whereas prevalence rates of anxiety in children in the community range between approximately 8% and 10% (Dufton 2009).

Children and adolescents with unexplained somatic symptoms and chronic medical illnesses with comorbid psychiatric disorders require and benefit from a bio-psychosocial approach in diagnostic and treatment assessment. Screening emotional and affective symptoms together with somatic evaluation may lead to more effective treatment outcomes and prognoses (Chavira et al. 2008).

2.7 Sense of coherence

Attitude toward illness is one of the key elements in determining an individual's ability to cope with a particular illness (Stanton et al. 2007). Coping or adaptability denotes one’s capacity to successfully deal with various limitations, restrictions and life stressors successfully, which interact dynamically with health and quality of life (Jacob et al. 2001). Antonovsky (1993) developed the concept of sense of coherence (SOC) to emphasize the means of recovery. Sense of coherence (i.e., salutogenesis) comprises three main components, each of which denotes a way to help oneself through the difficulties in life: the ability to understand what is happening (cognitive), the manageability of life situations in social networks (manageability), and the ability to find meaning in life (meaningfulness). SOC can be operationalized and scored with a 13-item Sense of Coherence self-rating questionnaire, which research has shown to be a valid tool for predicting treatment outcomes (Söderman et al. 2001).

SOC has been used to determine the treatment outcomes of vertiginous patients. In a study by Mendel et al. (2001), low SOC revealed psychosocial stress and emotional distress due more to disease than to the severity of vertigo symptoms. Söderman et al. (2001) observed a
significant correlation of SOC with quality of life, severity of vertigo, and anxiety. A high SOC strongly and positively related to health promotion, which helps to defend against anxiety, depression and burnout (Eriksson et al. 2006).

2.8 Treatment of vertiginous patients

An appropriate treatment regimen requires an accurate diagnosis. Because symptoms in an acute state of vertigo rarely result from purely psychological factors, evaluation aims to identify their organic origin. Individuals with chronic or recurrent vertigo may suffer from comorbid anxiety or depression. In such cases, psychiatric disorders should be evaluated for proper treatment (Luxon 2004). Minimizing psychological stress in the treatment of psychiatric disorders may alleviate various symptoms of vertigo, because anxiety and avoidance behavior resulting from fear of new attacks can strengthen and prolong symptoms of vestibular origin (Yardley et al. 2001). Anticipation of a severe attack, concerns about losing control, and fear of serious illness frequently handicap vertiginous patients (Yardley et al. 1994).

Vertigo has high potential for spontaneous relief. The balance system can adapt to new situations of input and output information, resulting in symptom relief through central compensation. Although the efficacy of this process is individual, it is independent of the organic base of the disturbance in vestibular function (Strupp and Brandt 2008). In cases of persistent vertigo, mechanisms of compensation are often inadequate, usually due to comorbid psychological stressors, impairment of sensory inputs of balance, drugs, or other medical disorders (Luxon 2004). Restricting daily activities due to chronic vertigo reduces exposure to motion stimulus, which may weaken vestibular compensation and thereby maintaining the handicap (Monzani et al. 2010).

The general principles of treatment include physical therapy, medication, and psychotherapy (Hain and Uddin 2003, Strupp and Brandt 2008).

2.8.1 Vestibular and balance rehabilitation therapy

In vestibular and balance rehabilitation therapy (VBRT), the physiotherapist instructs patients to expose themselves to movements that provoke the sensation of vertigo or dizziness. Specific exercises stimulate sensory inputs in a manner, which enables central
compensation and recovery. Exercises can include self-directed instructions for exposure or specific therapist-directed vestibular rehabilitation sessions. Vertiginous patients with agoraphobic symptoms in particular seem to benefit from therapist-directed sessions. In VBRT, patients can, with therapist assistance, safely perform physical movements, which provoke vertigo, thereby accustoming themselves to the function of balance in safe situations. This may relieve anxiety linked to motion and movement, improve confidence in controlling one’s balance, and reduce avoidant behavior (Jacob et al. 2001, Yardley and Redfern 2001). According to a study by Monzani et al. (2010), vestibular rehabilitation not only improves postural and balance control, but also reduces psychological distress and self-rated disability by reducing symptoms of depression. Own entity is benign paroxysmal positioning vertigo, where a single positioning maneuver, such as Epley’s maneuver, can eliminate vertigo symptoms resulting from displaced otoliths in the semicircular canal (Strupp and Brandt 2008, Post and Dickerson 2010).

2.8.2 Medication and psychotherapy

The use of medication in vertiginous patients aims to ameliorate acute symptoms of vertigo, to control stress caused by vertigo, and to prevent future attacks. Anticholinergics and benzodiazepines serve to relieve acute spells of vertigo. Their long-term use hinders central compensation, so their use should be limited to acute spells only. Antihistamines, beta-blockers and calcium channel antagonists serve to prevent long-term attacks. Antidepressants serve to activate the patient thereby enhancing rehabilitation. Drug therapy is tailored to each patient according to his or her vertigo and other symptoms (Hain and Uddin 2003, Strupp and Brandt 2008).

In the chronic phase of vertigo, psychological factors usually play a significant role in the patient morbidity. Possible psychiatric disorders are therefore important in assessing treatment beyond organic diagnoses. Medication combined with psychotherapeutic sessions has proved to be the most effective treatment for anxiety and depression, but controlled trials of psychotherapeutic interventions in vertiginous patients are unavailable (Pampalona 2004, Staab 2006). Selective serotonin reuptake inhibitors (SSRI), a first-line therapy for depression and anxiety, have undergone testing in patients with chronic dizziness combined with psychological symptoms with or without neurotologic etiology (Staab et al. 2002, Horii 2004, Staab et al. 2004, Simon 2005). In a study by Horii et al. (2004), vertiginous patients exhibiting signs of depression with or without organic disease benefited from paroxetine...
treatment more than did patients without depressive symptoms. The improvement in reducing depressive symptoms and subjective disability proved significant, but did not affect factors involving with dizziness. Staab et al. (2002) treated dizzy patients with different SSRIs for at least 20 weeks. Subjects with minor or major psychiatric disorders had the best treatment outcome despite the coexistence of other medical illnesses. In another study by Staab et al. (2004), patients with chronic subjective dizziness benefited from treatment with sertraline in terms of both psychiatric symptoms as well as physical symptoms and functional impairment. Vertiginous patients with anxiety and depression, in addition to subjects with chronic subjective dizziness, seem to benefit best from SSRI medication. However, optimizing the dose and length of treatment will require more long-term survey data.

Psychological factors and individual coping mechanisms affect the recovery process, yet the specific assessment and treatment of psychological symptoms remains uncommon. Physiotherapists have developed most of the existing rehabilitation programs. Many procedures for habituation training include elements of cognitive-behavioral therapy, which helps to control the autonomic sensation of vertigo. This therapy program improves not only the patient’s ability to cope with both the physical and psychological aspects of vertigo, but it also gives the patient a stronger sense of control in previously feared situations (Yardley and Redfern 2001).

Symptoms of vertigo can elevate arousal and autonomic sensations, which resemble somatic components of anxiety. These feared autonomic sensations can interfere with the habituation process. Methods of psychotherapy aim to soothe the patient’s enhanced or amplified perceptions of autonomic arousal (Yardley and Redfern 2001, Staab 2006). Some evidence indicates that autogenic training (AT) reduces symptoms in vertiginous patients. AT serves as a relaxation technique similar to yoga and meditation, and helps to relieve distress in patients with subjective symptom of vertigo and high stress and anxiety levels (Goto et al. 2008, Goto et al. 2011). A pilot study of cognitive behavioral therapy, together with vestibular and balance rehabilitation therapy, showed promising results (Jacob et al. 2001).
3 AIMS OF THE STUDY

The purpose of this study was to understand the psychiatric factors in adult, child and adolescent vertiginous patients, the prevalence of psychiatric symptoms, and means of coping with a chronic illness.

The specific aims were:

1. to investigate patients ability to cope, as measured with the SOC scale, in relation to specific symptoms of Ménière's disorder (MD) and with the disability resulting from the disease.

2. to assess the prevalence of depressiveness in a group of vertiginous patients gathered by a community sample.

3. to evaluate the prevalence of psychiatric symptoms and their effect on the functional capacity of vertiginous patients in a community sample.

4. to investigate the frequency and characteristics of psychiatric comorbidity in a group of vertiginous children and adolescents.
4. MATERIALS AND METHODS

The thesis consists of four studies, all conducted at the Helsinki University Central Hospital. The Ethics Committee of the Helsinki University Hospital approved the study protocol.

4.1 Materials

In Study I, data was collected by mailing an extensive questionnaire about different MD-related symptoms to the members of the Finnish Ménière’s Federation (Suomen Ménière Liitto, FMF). The questionnaire was sent in two phases. The first questionnaire was sent to every sixth person on membership list and reached 228 individuals, who provided 181 responses after two mailings, yielding a response rate of 79%. After the first mailing, open-ended questions on the respondents’ positive experiences were restructured as representative statements. This second questionnaire was sent to the remaining FMF members. The data underwent analysis after receiving an additional 366 responses. The number of recipients in the study totaled 547 (435 women and 112 men); their mean age was 61 years.

In Studies II and III, 5000 randomly selected persons over 12 years of age from the Helsinki University Hospital district received a questionnaire enquiring about their vertigo symptoms. Of the 3138 responders, 908 reported experiencing symptoms of vertigo. Of the vertiginous patients, SPSS software randomly selected 130 subjects for further neurotological investigation; of these, 100 (77%) completed these investigations. The group comprised 54 women and 46 men with a mean age of 51 years (range 18 to 76 years) at the time of response.

Study IV was a retrospective review of notes on vertiginous children and adolescents, who underwent examination at the Helsinki University Central Hospital ENT Clinic for symptoms of vertigo between the years 2000 and 2004. These 119 children ranging in age from 7 months to 17 years (63 girls and 56 boys) comprised approximately 1% of the pediatric patients during this five-year period. Their mean age at time of investigation was 10.9 years.
4.2 Methods

4.2.1 Study I

The 26-page questionnaire in Study I consisted of:

A. Vertigo questionnaire
   The vertigo questionnaire has been planned and used in the Helsinki University Hospital ENT unit to collect information about vertiginous patients. This questionnaire contains its own questions about vertigo, lightheadedness and unsteadiness, respectively, to ease the characterization of the patient’s condition (Kentala 1996, Kentala et al. 1999).

B. Enriched EuroQol EQ-5D
   The EQ-5D, a self-reported questionnaire measuring health-related quality of life, consists of five questions describing the subjective measurement of wellbeing; responses to these questions are then converted into a single summary index on a visual summary scale ranging from 100 (best possible health) to 0 (worst imaginable health) (Kind et al. 1998).

C. The International Tinnitus Inventory (ITI)
   The International Tinnitus Inventory is an eight-item questionnaire based on the most common patient-reported complaints attributed to tinnitus that helps researchers to identify individuals’ most significant tinnitus-related complaints (Kennedy et al. 2005).

D. The Hearing Measurement Scale
   The Hearing Measurement Scale is a standard interview for measuring auditory disability that includes 42 scoring and several supplementary items (Noble and Atherley 1970).

E. The Hearing Disability and Handicap scale (HDHS)
   The HDHS serves to measure the negative effect of hearing loss. The questionnaire contains 20 items related to hearing problems and 7 items that focus on occupation, the duration of hearing problems, and hearing aid usage (Barrenas and Holgers 2000).

F. Dizziness handicap scale
   The Vertigo Symptom Scale, designed to assess symptoms of balance disorder, somatic anxiety, and autonomic arousal in patients with vertigo, includes the vertigo handicap scale, which uses 25 statements to assess the disabling consequences of vertigo (Yardley et al. 1992).
G. Participation restriction scale
The International Classification of Functioning, Disability and Health is the WHO’s internationally standardized framework for measuring health and health-related matters. These different areas of life include body-functions and structure, as well as activity and participation (Gianopoulous et al. 2001).

H. SOC
The sense of coherence scale (SOC) is a global self-rated questionnaire developed by Anton Antonovsky to define salutogenesis (i.e., the means for helping oneself through life’s challenges). The sense of coherence consists of three domains: the ability to understand what is happening (cognitive), the manageability of life situations in social networks (manageability), and the ability to find meaning in life (meaningfulness) (Antonovsky 1993). Research has demonstrated the tool’s validity for predicting treatment outcomes, especially in terms of psychosocial adaptation and subjective adaptability to a medical condition (Kouvonen et al. 2008). Antonovsky selected the 13 most important questions to create a shortened version of the original 29-item questionnaire. Several studies have shown the validity and reliability of Antonovsky’s 13-item SOC scale (Korotkov 1993, Feldt et al. 2007). Based on the previous study, the SOC scores are classified into three classes: 35-60, representing weak SOC; 61-75, moderate; and 76-91, strong SOC (Söderman et al. 2001). Recent studies have also validated the 13-item questionnaire in Finnish (Poppius et al. 1999, Kivimäki et al. 2000).

4.2.2 Studies II and III
In Studies II and III, responders to the questionnaire were asked based on the above-mentioned vertigo questionnaire about hearing loss, tinnitus, medication, general somatic illness, former head or ear trauma, ear operations, ear infections, exposure to noise at work, use of hearing protection, headache, and use of alcohol and tobacco, in addition to socioeconomic status and education. If recipients reported any sensation of vertigo, further questions inquired about the frequency, intensity, and duration of the attacks, the time since last attack, and the respondent’s age at the onset of symptoms, as well as the influence of the vertigo attack on working capacity.

A senior otologist performed a specific neuro-otological examination and a thorough interview for case history of 100 randomly selected individuals at the Helsinki University ENT
The examinations entailed otorhinolaryngological and neurotological investigations supplemented with a hearing test and otoacoustic emissions (electronystagmography, posturography, saccadic and pursuit eye movements, otoacoustic emissions).

Psychiatric symptoms were investigated with:

A. Beck Depression Inventory
   The Beck Depression Inventory (BDI) is a 21-item self-reported scale measuring manifestations and symptoms of depression. Each question has four alternatives (0-3), and the recipient chooses the one that most accurately reflects his or her mood at that moment. Scores from 10 to 18 indicate mild depression, 19 to 29, moderate depression, and 30 or more, severe depression. The BDI is in wide use, and several studies across different languages have demonstrated its reliability and validity in detecting depression in the somatically ill (Beck et al. 1961). Having previously been validated in Finnish (Viinamäki et al. 2004, Suija et al. 2012), the BDI is also used in Finland as a screening instrument for symptoms of depression.

B. Zung Anxiety Scale (SAS)
   The Zung Anxiety Scale is a rating instrument for clinical purposes measuring affective and somatic symptoms of anxiety. The self-rating anxiety scale (SAS) consists of 20 statements scored from 1 to 4 according to how much the statement applies to recipients' feelings during the past week. The total score is a summation of the rated responses, which is converted to the anxiety index. An anxiety index score below 45 is within normal range, 45 to 59 indicates minimal to moderate anxiety, 60 to 74 reflects marked to severe anxiety, and an index score of 75 or more implies extreme anxiety (Zung 1971). The SAS has also been validated in Finnish (Leppävuori et al. 2002).

C. The DSM-IV and ICD-10 personality questionnaire (DIP-Q)
   The DSM-IV and ICD-10 personality questionnaire (DIP-Q) is a self-reported questionnaire which combines the two upgraded diagnostic systems: the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) and the ICD-10 (International Statistical Classification of Disease and Related Health Problems). The DIP-Q comprises 135 statements with yes or no answers. A respondent must fulfill a specific number of criteria before personality disorder is assessed.
The Dip-Q questionnaire includes the Global Assessment of Functioning (GAF) Scale, corresponding to the respondent’s subjective sense of impairment at the time of response (GAF 1) and one month previously (GAF 2). Studies have shown the Dip-Q’s acceptable reliability when validated against structured interviews. It’s questions are based on DSM-IV criteria, which frequently serve in research worldwide (Ottoson et al. 1998, Hesse 2005).

4.2.3 Study IV

In Study IV, medical records of 119 vertiginous children, who had visited the Helsinki University Central Hospital’s ENT clinic with a primary complaint of vertigo, were identified from their ENT clinic discharge codes and retrospectively reviewed. The data included detailed information about the patient’s symptoms of vertigo, possible provoking factors, ear symptoms, other symptoms associated with vertigo, past medical history of the patient and his or her family, and examinations performed to verify the diagnosis. More information was collected about possible laboratory and otoneurological tests, imaging studies, and documents from consultations with other neurological, ophthalmological, and psychiatric specialists. ENT doctors analyzed the database. The vertigo diagnoses were based on standard published criteria (Basser 1964, Headache Classification Committee of the International Headache Society 1988, Dix and Hallpike 1952, American Academy of Otorhinolaryngology – Head Neck Foundation Inc. 1995, Neuhauser et al. 2001). Typical findings from investigations and a positive case history served to confirm the ENT diagnosis.

When no organic cause of vertigo could be verified despite a thorough clinical examination, psychiatric consultation took place. Of 119 children, 9 underwent a psychiatric interview. These data were reviewed for both personal and family history, information about family dynamics, the children’s history of school success, and their social life. Any possible predisposing factors were evaluated for vertigo of psychogenic origin, extracted and classified this information from their medical records, and assessed the diagnoses according to the ICD-10 criteria.

4.3 Statistical analysis

In Studies I-III, data were stored in a database for statistical analysis with SPSS software versions 11.0 and 16.0. Frequencies, means, ranges, standard deviations, and percentages were calculated for most of the variables. Correlations were then analyzed with Spearman
correlation coefficient between continuous and normally distributed variations to identify any associations between different symptoms. Significances were confirmed with the Student’s t-test and one-way analysis of variance (ANOVA).

In Study I, respondents were categorized into three groups according to their SOC scores before undergoing statistical analysis. The group means were compared with ANOVA. The answers to open-ended questions about positive experiences and participation restrictions were classified and analyzed with ANOVA. Any significantly different means were determined with Tukey’s test. The differences between low and high SOC groups were evaluated with Kruskal-Wallis analysis. Logistic regression analysis served to model the data, and Study I used error bars of means with 95% confidence intervals.

Study IV used data extracted from medical records and subsequently classified. The psychiatric diagnoses were based on standard ICD-10 criteria.
5 RESULTS

5.1 Sense of coherence in vertiginous patients (1)

SOC was related to coping with the disease. Patients with higher SOC scores had significantly higher scores on the EQ-5D TTO and health meter measures (p < 0.001). The number of positive experiences of Ménière's disorder correlated positively with SOC scores (Table 3). Patients with lower SOC scores considered their symptoms to be more severe and rated their EQ-5D, measured with the TTO and VAS scales, as poorer; they also experienced significantly more symptoms of anxiety (p < 0.01), depression (p < 0.01), and feelings of listlessness (Kruskal-Wallis).

Table 3. Demographics of subjects classified in tertiles by SOC score

<table>
<thead>
<tr>
<th></th>
<th>SOC low</th>
<th>SOC moderate</th>
<th>SOC high</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Score 35-60)</td>
<td>(Score 61-75)</td>
<td>(Score 76-91)</td>
<td>112(21)/435(79)</td>
</tr>
<tr>
<td>Gender Male/Female (%)</td>
<td>19(14)/115(86)</td>
<td>47(21)/174(79)</td>
<td>46(32)/146(68)</td>
<td>112(21)/435(79)</td>
</tr>
<tr>
<td>Mean SOC (SD)</td>
<td>51.7(7.6)</td>
<td>68.4(4.4)</td>
<td>82.3(4.2)</td>
<td>69.2(12.8)</td>
</tr>
<tr>
<td>Duration of MD yrs. (SD)</td>
<td>15.0(10.8)</td>
<td>15.7(10.8)</td>
<td>16.5(11.7)</td>
<td>15.8(11.1)</td>
</tr>
<tr>
<td>Mean Euroqol VAS (SD)</td>
<td>0.65(0.17)*</td>
<td>0.74(0.18)*</td>
<td>0.84(0.17)*</td>
<td>0.76(0.19)</td>
</tr>
<tr>
<td>Number of positive experiences</td>
<td>92</td>
<td>152</td>
<td>142</td>
<td>386</td>
</tr>
</tbody>
</table>

* p < 0.05
SOC = sense of coherence score
SD = standard deviation
MD = Ménière’s disease
EuroQol = standardized self-rated health measure
VAS = visual analog scale

The SOC scores correlated significantly (p < 0.001) with the measure rating the impact of MD in a five-step mode. Vertigo (p < 0.01), gait problems (p < 0.01), hearing difficulties (p < 0.01), tinnitus (p < 0.01), and a feeling of pressure (p < 0.01) in the ear correlated significantly with SOC scores in the severity ratings. Patients with lower SOC scores found the symptoms to be more severe. Duration of the disorder or demographics were unrelated to SOC scores.
The influence of MD on everyday life differed across SOC groups. Those with low SOC scores experienced a loss of energy and fatigue significantly (p=0.034) more often than did subjects with high SOC scores.

In the open-ended questions, respondents listed the means they used to improve and prevent symptoms of MD (n = 181). We found no marked differences in the number or details of the responses. In all SOC groups, normal living habits, such as salt restriction, a regular lifestyle with a sufficient sleep and physical exercise, were the means they used to stabilize their health condition. Interestingly, but statistically non-significantly, difference was evident in the low SOC group, which relied on drugs as their first choice to deal with symptoms of MD. Patients with high SOC scores were more likely to report positive effects of the disease on their life than were patients with low SOC scores. They also had fewer restrictions on their participation in hobbies, conversation, exercise, and household tasks.

5.2 Depressive symptoms in vertiginous patients (II)

The prevalence of depressiveness was assessed in a group of 100 randomly selected vertiginous patients. Of 99 (99%) responders, 19 (19%) scored 10 or more on the BDI questionnaire, indicating symptoms of depression. Of the 19 subjects, 10 were men and 9, women. Depressiveness was mild to moderate in 15 subjects and moderate to severe in 4. Those with scores over 18 on the BDI (2 of 4) were more likely to mention any previous mental disorders than were less depressive individuals (4 of 15). The etiologies of vertigo appear in Table 4. Those groups of subjects who scored over the cut-off point showed no significant diagnostic differences in either vertigo symptoms (p = 0.68) or in general health (p = 0.69) from those with normal BDI scores.

The effect of vertigo on daily living was more disabling among patients with more symptoms of depression. GAF estimates and the number of symptoms of depression correlated significantly (P < 0.01, 95% confidence interval 10.59 to 24.76). Those depressive individuals had no more somatic illnesses than did other patients. Depressiveness correlated positively for patients with vertiginous relatives (P < 0.01). According to the Zung anxiety scale, only two patients exhibited symptoms of anxiety concurrent with depressiveness.
5.3 Psychiatric symptoms in vertiginous patients (III)

Most (89.1%) of the patients had experienced their vertigo symptoms for more than one year. The prevalence of any psychiatric problem based on the questionnaires was 68% (68 patients). Of the Axis I disorders, 4 (4%) met the criteria for depressiveness only, but 19 (19%) did when they were comorbid with other psychiatric symptoms. Of the subjects, 12 met the criteria for anxiousness. We found no significant differences in demographic details between the groups.

Of the 100 patients investigated, 63% (63) met the criteria for features of personality disorder (PD); 49% (31/63) of patients with PD met the criteria for only one PD. The most prevalent PDs were obsessive-compulsive personality (46 subjects), borderline (19), and schizotypal (16), respectively. No significant differences emerged between different features of the PDs and symptoms of vertigo.

Characteristics of personality disorder alone had no incapacitating influence on their subjective level of functioning, as measured by GAF scores, regardless of the number of PDs (Table 5). The most severe disability occurred in subjects with symptoms of anxiety combined with depressiveness, and groups exhibiting both Axis I and Axis II symptoms. We found no significant differences between different groups of psychiatric conditions and patients with no psychiatric problems in their reported number of other symptoms (tinnitus, slip falls, nausea, impaired hearing), degree of daily disturbance, frequency or intensity of vertigo attacks. The subjective feeling of disability showed no correlation with socioeconomic status in any groups.

Subjects with features of PD reported significantly more experiences of disturbing tinnitus only. In different groups with PD, only obsessive-compulsive PD correlated significantly with seeking further investigations due to vertigo, even though they presented with no additional general illnesses or symptoms of vertigo. Having more than one PD diagnosis was irrelevant.
Table 4. Etiologies of vertigo in subjects with symptoms of vertigo

<table>
<thead>
<tr>
<th>Etiology</th>
<th>BDI ≥ 10 (%)</th>
<th>BDI &lt; 10 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ortostatic</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Tensional</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td>Ear</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Central</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>81</td>
</tr>
</tbody>
</table>

BDI = Beck Depression Inventory

Table 5. GAF scores in different groups of psychiatric diagnoses

<table>
<thead>
<tr>
<th>Psychiatric symptoms</th>
<th>n</th>
<th>GAF (mean)</th>
<th>SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>32</td>
<td>83.2</td>
<td>7.9</td>
<td>0.84</td>
</tr>
<tr>
<td>Anxiousness</td>
<td>6</td>
<td>48.8</td>
<td>30.3</td>
<td>-0.26**</td>
</tr>
<tr>
<td>Depressiveness</td>
<td>4</td>
<td>67.5</td>
<td>26.3</td>
<td>-0.81</td>
</tr>
<tr>
<td>Axis I symptoms</td>
<td>23</td>
<td>64.7</td>
<td>25.3</td>
<td>-0.36**</td>
</tr>
<tr>
<td>Features of PD only</td>
<td>43</td>
<td>81.2</td>
<td>14.6</td>
<td>-0.14</td>
</tr>
<tr>
<td>Axis I and Axis II</td>
<td>19</td>
<td>58.9</td>
<td>28.0</td>
<td>-0.40**</td>
</tr>
</tbody>
</table>

**p < 0.01
GAF = Global Assessment of Functioning
PD = Personality Disorder

5.4 Somatoform disorders in vertiginous children (IV)

We carried out a retrospective review to investigate psychiatric comorbidity and its frequency in vertiginous children. Diagnoses of vertigo were based on standard published criteria. A thorough clinical examination, usually by several doctors of various specialties, served to exclude organic causes of vertigo in the psychogenic children. A psychiatric consultation took place in the absence of an organic cause of vertigo.
The diagnoses of vertigo appear in Table 6. Initially, six children exhibited clear psychogenic vertigo. During the two-year follow-up, three more children presented with symptoms of apparent psychiatric origin. Altogether nine (8%) vertiginous children showed a vertigo of psychiatric origin. In psychogenic vertigo, symptoms tend to decrease over time, but their vertigo manifested with more episodes or constant duration, which led to more frequent absences from school than for patients with true vertigo or symptoms of some other organic origin. Children with vertigo of psychosomatic origin showed normal neurotological status, normal MRI results and laboratory values. Four patients were hospitalized for their debilitating symptoms of vertigo, two of whom were later referred to psychiatric hospital care.

Major depression was the most common (5 of 9) psychiatric disorder in patients with vertigo of psychosomatic origin. The somatization disorder manifested in three patients, yielding a prevalence of 2.5%. Their symptoms were more severe and obscure than in patients with other psychiatric disorders. The most common psychosocial findings were family conflict (divorce, absence of a parent) and problems at school. In three cases, functional capacity deteriorated severely, leading the patient to drop out of school, whereas minor school problems, such as bullying, repeated absence from school, and minor difficulties, were more common.

Only two children had previously contacted a psychiatric outpatient clinic. Three children had previously suffered from somatic illness, but had totally recovered before the onset of vertiginous symptoms. Information on parental health was sparse available, but in one case, the father’s serious disease seemed to have provoked the child’s somatization.
Table 6. Vertigo diagnoses of 119 children and adolescents

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benign paroxysmal vertigo of childhood</td>
<td>23</td>
</tr>
<tr>
<td>Migraine-associated vertigo</td>
<td>17</td>
</tr>
<tr>
<td>Vestibular neuronitis</td>
<td>14</td>
</tr>
<tr>
<td>Otitis media-related vertigo</td>
<td>12</td>
</tr>
<tr>
<td>Psychogenic vertigo</td>
<td>6</td>
</tr>
<tr>
<td>Vestibulopathy (unknown)</td>
<td>6</td>
</tr>
<tr>
<td>Post-traumatic vertigo</td>
<td>6</td>
</tr>
<tr>
<td>Inner ear irritation, sudden deafness</td>
<td>4</td>
</tr>
<tr>
<td>Labyrinthine hydrops</td>
<td>4</td>
</tr>
<tr>
<td>Tension neck</td>
<td>4</td>
</tr>
<tr>
<td>Orthostatic hypotension</td>
<td>4</td>
</tr>
<tr>
<td>Epilepsy-related vertigo</td>
<td>3</td>
</tr>
<tr>
<td>Ménière’s disease</td>
<td>2</td>
</tr>
<tr>
<td>Chronic cholesteatoma and surgery</td>
<td>2</td>
</tr>
<tr>
<td>Mal de barquement</td>
<td>1</td>
</tr>
<tr>
<td>Benign paroxysmal positional vertigo</td>
<td>1</td>
</tr>
<tr>
<td>Autoimmune thyroiditis, hypothyreosis</td>
<td>1</td>
</tr>
<tr>
<td>Insulin shock-related vertigo</td>
<td>1</td>
</tr>
<tr>
<td>Sinusitis-related vertigo</td>
<td>1</td>
</tr>
<tr>
<td>Chiari I malformation</td>
<td>1</td>
</tr>
<tr>
<td>Ataxia (genetic)</td>
<td>1</td>
</tr>
<tr>
<td>Postoperative vertigo (astrocytoma operated)</td>
<td>1</td>
</tr>
<tr>
<td>CATCH 22 syndrome</td>
<td>1</td>
</tr>
<tr>
<td>Ophthalmic vertigo</td>
<td>1</td>
</tr>
<tr>
<td>Otitis media- and migraine-related vertigo</td>
<td>1</td>
</tr>
<tr>
<td>Mononucleosis</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>119</strong></td>
</tr>
</tbody>
</table>
6. DISCUSSION

6.1 Methods

6.1.1 Representativeness of the sample
The sample of subjects in Study I represents members of the Finnish Ménière Federation; membership is open to all and does not require a verified diagnosis of MD. The study group was based on the questionnaire symptoms that fit MD, but not a confirmed diagnosis of MD. The sample represents well the typical patient with symptoms of MD. The mean age of the respondents was 61 years (SD 11), and the mean reported age of onset was 43 years (SD 13), both of which are in line with corresponding figures from studies of the prevalence of MD (Watanabe et al. 1995, Havia et al. 2008). Research has shown MD to affect both genders equally. In this study, 79% of respondents were female and 21% were male, percentages which closely represent the gender distribution in the Finnish Ménière Federation, but which may also reflect the general eagerness of women to participate in studies.

The sample of 5000 subjects in Studies II-III was gathered from the population of the Helsinki University Hospital area in Southern Finland who were age 12 or older. The mean age of men was 43 years, and of women, 46 years (range 12-99). The age distribution appears in Table 7. According to the Population Register Center (Tilastokeskus 2000), 49% of the total population of the Helsinki University Hospital area is men, and 51%, women. The gender distribution of the entire study sample is similar to that of the general population, but in the final sample of 3116 respondents, 44% were men and 56% were women, again reflecting the general willingness of women to participate. To evaluate the validity of the population study, 100 of 130 vertiginous candidates were randomly selected for further investigation. Of this clinically studied group, 46% were men and 54% were women. The mean age of the men at the time of response was 55 years, and of women, 48 years.

Sample selection bias in Studies II and III cannot be entirely ruled out, as it may have affected the prevalence rates, especially in cases of PD. The prevalence of depressiveness and symptoms of anxiety are in line with those of previous studies. The subjects of the final sample represented a chronic state of vertigo, as the mean duration of symptoms was more than one year. The sample is probably representative of the Finnish urban and suburban people but not the primary care population.
Study IV comprises a retrospective review of children who had previously visited the ENT clinic of the Helsinki University Hospital. The patients were remitted to the ENT clinic from primary care or from other specialties in the Children’s Hospital during a five-year period. Of these children, 76% came for consultation from a pediatrician or child neurologist. The group accounted for 0.7% of the child population visiting the ENT clinic at that time. This sample of 119 children represents patients of tertiary referral clinic.

### 6.1.2 Study limitations

The inclusion criterion in Study I was membership in the Finnish Ménière Federation. Whether all subjects had a diagnosis of MD remains unknown, but most of the subjects presented with the triad of symptoms specific to MD at the time of investigation. The small number of men in the study diminishes the statistical power of this investigation, though the small number was unrelated to the SOC scores.

A low SOC score correlated with psychological problems such as anxiety, fatigue, and depression. Studies (Mendel et al. 2001, Tschan et al. 2011) have shown that SOC associates more with emotional distress than with disease-specific symptoms, as it did in this study. We asked about patients’ general state of health and medication taken on a regular basis, but did not screen for specific psychiatric symptoms. So, whether more serious psychiatric problems could have affected and lowered their SOC scores and generic health measures, as well as reduced the number of positive experiences remains unclear.

---

<table>
<thead>
<tr>
<th>Age</th>
<th>Total sample 5000</th>
<th>Final sample 3116</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Male</td>
</tr>
<tr>
<td>12-30</td>
<td>1308</td>
<td>657</td>
</tr>
<tr>
<td>31-50</td>
<td>1849</td>
<td>887</td>
</tr>
<tr>
<td>51-70</td>
<td>1329</td>
<td>635</td>
</tr>
<tr>
<td>Over 70</td>
<td>514</td>
<td>180</td>
</tr>
</tbody>
</table>

Table 7. Age distribution in Studies II and III
The descriptive analysis of the subjects with MD in Study I did not involve a control group. The findings represent not the general population, but only subjects with chronic disease.

The most important limitation of Studies II and III is the screening for psychiatric symptoms only with questionnaires. The bases of these studies were the psychiatric symptoms of vertiginous patients. The respondents’ medical history and information about their general illnesses derived from the questionnaires, which inquired about symptoms of vertigo, specific risk factors associated with vertigo, the impact of symptoms on respondents’ working capacity, and general questions about respondents’ socioeconomic status and general health. Self-reported questionnaires served to assess psychiatric symptomology (BDI, SAS, DIP-Q). The patients in Studies II and III had undergone a clinical evaluation only in otology and neurotology; a proper evaluation of psychiatric diagnoses would have required a thorough examination of each subject’s medical history together with a standardized psychiatric interview. An appropriate assessment of psychiatric diagnosis is based on clinical examination, which these studies lacked.

Self-reported questionnaires can offer information which helps clinicians evaluate symptoms, confirm diagnoses, and assist with decision-making. The respondents’ scores on the questionnaires correlate well with clinical findings of depression, but are generally more sensitive than they are specific (Katon et al. 1986). Self-reported questionnaires on personality disorders have shown acceptable reliability when compared to structural interviews: they have good screening properties and are easily administered, timesaving, and free from interviewers’ systematic biases (Zimmerman 1994). A common feature of questionnaires is their tendency to over-diagnose personality disorders. Although questionnaires are sensitive enough to detect symptoms, they fail to distinguish whether symptoms are traits or exponents of a state (Bodlund et al. 1998).

The lack of proper psychiatric history is a common problem in studies conducted to assess the prevalence of psychiatric comorbidity in patients with vertigo. The causes of psychiatric disorders are multifactorial; risk factors for illness can include genetic liability, negative life events, psychosocial stress and poor parenting in childhood, a prior history of psychiatric symptoms, and recent stressful life events and difficulties (Kendler et al. 2002, Kendler et al. 2006b). Symptoms of vertigo themselves can provoke psychological distress and psychiatric disorders in those who are vulnerable, but the course of a psychiatric disorder is usually long-standing, recurrent, and chronic. The use of a longitudinal design with a follow-up setting
would have highlighted these phenomena more clearly as would a more thorough study design involving clinical evaluation and proper psychiatric history. Screening current psychiatric symptoms without follow-up and clinical evaluation may have enriched the prevalence of psychiatric problems.

In Studies II and III, the prevalence of psychiatric symptoms was high, but in line with those of previous studies (Table 2). The high prevalence of obsessive-compulsive PD was especially surprising. DIP-Q has showed high validity for Cluster C personality disorders, and especially for obsessive-compulsive PD (Ottoson et al. 1998), but this finding requires replication with a comprehensive study design. The study group was drawn from a community sample. The medical data, symptoms, and diagnoses of vertigo were compared between subjects with and those without psychiatric symptoms. The subgroup of patients with no psychiatric symptoms was probably too small for a control group to draw useful conclusions.

The diagnostic evaluation in Study IV was based on each patient’s medical history. The major challenge was to obtain an accurate patient history and information about the patient’s details and family history. Patients with suspected psychogenic vertigo underwent psychiatric examination. The psychiatric records of these patients were thoroughly examined for probable provocative factors contributing to vertigo and distress. Especially when examining children and adolescents, information obtained from parents is essential to obtaining a comprehensive patient history, which in most of these cases proved insufficient. Not all variables could be controlled and operationalized due to this lack of adequate information.

The study group comprised children and adolescents referred to the ENT clinic from primary care or from other specialties in the Children’s Hospital. Most (76%) of the patients had visited a pediatrician or pediatric neurologist and were referred to otology because their vertigo was considered to be ear-related. This group was biased with respect to primary care population.

The prevalence of vertigo among the children and adolescents who visited the ENT clinic during the five-year study period was 0.7%. According to previous epidemiological studies, this figure is in line with those of other studies conducted in tertiary ENT and neurology clinics (Bower and Cotton 1995, Weisleder and Fife 2001), but lower than in population-based studies (Russel and Abu-Arafeh 1999). The study group represents only tertiary clinic patients, which may have influenced on the prevalence of psychiatric comorbidity as well. The prevalence of psychogenic vertigo, for example, was 8%. In previous surveys conducted in
tertiary clinics, its prevalence rates varied from 10% to 24% (Erbek et al. 2006, Szirmai 2010, Gruber et al. 2012). The absence of a control group compromises generalizing this finding to other groups.

6.2 Sense of coherence in vertiginous patients

This study investigated the impact of MD on members of the Finnish Ménière Federation. Although not all members of the federation may not have had a verified diagnosis of MD, they do represent well the typical patient with symptoms of MD.

SOC is a means to measure attitude toward the disease. Studies have shown that a high SOC protects against psychological distress and is strongly related to health promotion, but the point where this protective effect begins remains unknown (Eriksson and Lindström 2006). In the present study, subjects with high SOC scores reported more positive attitudes toward their illness and seemed to better handle their life between attacks of vertigo. The impact of MD was less restrictive in daily living. These findings are in line with those of previous studies by Mendel et al. (2001) and Hågnebo et al. (1997).

Subjects with a low SOC score reported hesitating more when performing normal everyday tasks, such as answering the phone, traveling alone, shopping, enjoying leisure time and engaging in hobbies, which also impacted on their generally poor health-related quality of life. Restrictions imposed by the symptoms of MD seem to impair social functioning, and result in a loss of self-efficacy. A study by Yardley (1994) found more severe disability in patients with a low internal locus of control, which in practice meant dependency on drugs and help from others help. In the present study, responders with low SOC scores used drugs to relieve their symptoms twice as often as did those with high SOC scores. A low SOC score was linked to VSS anxiety and feelings of low energy.

Higher SOC may reflect dispositional optimism, which promotes acceptance and more effective handling of the symptoms and restrictions of illness. An optimistic attitude towards life leads to better adaptation and enhances recovery together with better outcomes of chronic disease (Stanton et al. 2007, Tschan et al. 2011). A high SOC score presumable also represents the ability to adapt to recurrent vertigo spells and to improved treatment compliance (Tschan et al. 2011). In the present study, respondents with higher SOC scores seemed to control the unpredictability of their disease more effectively than did subjects with a lower sense of coherence, who hesitated more when performing normal daily tasks and
suffered from symptoms of vertigo more severely than did those subjects with high SOC scores. A high SOC score likely showed less association with psychological distress, as the studies by Mendel et al. (2001) and Tschan et al. (2011) showed. All responders emphasized the significance of a healthy and peaceful lifestyle in controlling their MD.

6.3 Depressive symptoms in vertiginous patients

Of the subjects, 19 scored 10 or more on the BDI questionnaire, indicating depressive symptoms. The prevalence of depressiveness was 19%, double the prevalence as in the general population (Ayoso-Mateos et al. 2001, Kendler et al. 2002, Kendler et al. 2006a). In previous studies of vertiginous patients, the prevalence rates of depression varied from 3% to 45% (Sullivan et al. 1993, Yardley 1994, Yardley et al. 1998, Söderman et al. 2002, García et al. 2003, Grunfeldt et al. 2003, Pollak et al. 2003). These studies were usually conducted in secondary or tertiary clinics, where the patient sample is selected.

There was no difference in the etiology of vertigo between depressed and non-depressed patients, and their state of depressiveness failed to correlate with any specific symptoms of vertigo or soma. More men than women exhibited symptoms of depression, which was a non-significant but nevertheless interesting result. Epidemiological studies have found that the prevalence of depression in women is double that in men (Ayoso-Mateos et al. 2001, Kendler et al. 2002, Kendler et al. 2006a). A depressed mood is often comorbid with somatic diseases, but women are nevertheless more vulnerable (Kuehner 2003, Kendler et al. 2006a). In this study, men’s state of health appeared to be slightly worse than women’s, but state of health did not correlate with depressive mood.

The population-based patient sample in this study may have affected the prevalence rate. The study protocol may have found men more easily. Some studies (Mittal et al. 2001) have proposed men to be more likely to react to pain or disability. Yardley et al. (1992) found that vertiginous patients worried about losing control, of having a serious illness, and are anticipating a severe attack. The loss of capacity to maintain control of oneself may contribute to the depressed mood, which may especially hold true for vertiginous men.

Symptoms of depression unrelated to any specific symptoms of vertigo or soma. However, patients were more likely to be depressed if their relatives suffered from vertigo, which may explain the psychological reason for their depressed mood. Vertigo can be a debilitating and chronic illness; although a chronic outcome can occur after even a single episode of dizziness
(Garcia et al. 2003), but depression alone does not cause vertigo (Staab and Ruckenstein 2003).

Almost 90% of depressed patients received no proper anti-depressive care. A growing body of evidence indicates that vertiginous patients with psychiatric comorbidity have an increased risk for disability and poorer prognosis (Jacob and Furman 2001). Studies by Horii et al. (2004) and Staab et al. (2002, 2004) have shown that depressed dizzy patients improved with antidepressants, such as selective serotonin reuptake inhibitor. Most symptoms of vertigo subside over time, but rehabilitation may enhance this normal improvement. The balance-retraining techniques involved are familiar to cognitive-behavioral psychotherapy (Yardley et al. 1994, Staab 2006). Depressive patients may benefit more than vertiginous patients in general when anti-depressive medication is combined with vestibular rehabilitation therapy. Pharmacotherapy combined with psychotherapy has proved more effective in treating depressive patients (Pampalona et al. 2004).

6.4 Psychiatric symptoms in vertiginous patients

The prevalence of any symptoms of a psychiatric condition was 68%. Of axis I disorders, 12% of the subjects exhibited symptoms of anxiety and 19%, depressiveness. The prevalence of anxiety in community samples of vertiginous patients is in line with the present findings. A study by Best et al. (2009) found that the incidence of anxiety decreased during the follow-up period regardless of whether subjects had a previous history of anxiety. Since 89% of the patients in this study reported duration of their vertigo symptoms of more than one year, this prevalence likely reflects a chronic state of vertigo. The sample size used in this study was probably too small to draw broader generalizations. The psychiatric symptoms failed to relate to any demographic details or etiologies of vertigo. Study II reports on an analysis of symptoms of depression in vertiginous patients.

One personality disorder (PD) was detected in 63% (63/100) of patients, 26 of whom had more than one PD. The most prevalent PD was features of obsessive-compulsive personality disorder with a prevalence of 46% (n = 46). In earlier studies, the prevalence of PD in psychiatric outpatients with one of the official personality disorders was 31%. Including personality disorders not otherwise specified raised the prevalence to 46% (Zimmerman et al. 2005). In a study of a community sample by Torgersen et al. (2001), the prevalence rate for one specific PD was 13%. The most prevalent PD was avoidant (5%), followed by obsessive-
compulsive (2%). The mean number of PDs among those with PD was 1.5. In this study, the mean number of personality disorders was 3.6 with and 1.5 without an Axis 1 comorbidity.

In the present study, PDs seem to occur frequently in vertiginous patients, thus confirming the results of previous studies by Godemann et al. (2004). They found dependent personality structure to be prevalent among chronic vertigo patients, but insignificantly. In this study, the most prevalent PD features of obsessive-compulsive personality disorder belong to a Cluster C personality sharing anxious and fearful features. Persons with obsessive-compulsive disorder are characterized as rigid, constricted, and anxious (American Psychiatric Association 2000). Because symptoms of vertigo are usually unpredictable and uncontrollable, they can provoke uncertainty and fear of new spells. Concern about losing control, fear of serious illness, and anticipation of a severe attack of vertigo fuel emotional disturbance, thus elevating the arousal of symptoms of vertigo by amplifying autonomic symptoms, such as heart pounding, sweating, hot or cold spells, feeling faint or shortness of breath. Stress and anxiety can provoke or even induce symptoms of vertigo (Yardley et al. 1994, Yardley and Redfern 2001). The unpredictability and uncontrollability of vertigo in patients with obsessive-compulsive PD can compromise their ability to cope, thus leading to chronic vertigo. This phenomenon requires further investigation. The present study protocol may have found structures of obsessive-compulsive personalities more easily because, being characterized as duteous, they might have completed the questionnaire more eagerly. Assessing the diagnosis of a psychiatric disorder requires personal examination of the patient, which was lacking. Questionnaires usually serve to contemplate the evaluation.

If patients in this study had both Axis I and Axis II symptoms at the same time, subjective loss of functional capacity associated with Axis I disorders, symptoms of anxiety, and symptoms of depression with anxiety; PD alone failed to have an effect on functional capacity. Subjective feelings of loss of daily function showed no correlation with deficits on neurotological testing. In the chronic phase of vertigo, vertigo symptoms themselves appeared not to influence on subjective feelings of debilitation. Psychiatric symptoms affect the clinical picture of vertigo along a more debilitating and disabling course.

6.5 Somatoform disorders in vertiginous children

The prevalence of psychogenic vertigo, that is, the sensation of vertigo with no somatic cause, was 8% in studied group of 119 children and adolescents. Of the 119 patients examined, 3
were diagnosed with somatization disorder according to the ICD-10 criteria, yielding a prevalence of 2.5%. In a community-based study by Fritz et al. (1997), 1.1% of children and adolescents fulfilled the criteria for a diagnosis of somatization disorder according to the DSM-III-R. The remaining psychogenic reasons for the vertigo of patients in the present study were depression, panic disorder and obsessive-compulsive disorder. Only the most difficult cases of somatization disorders were seen in a tertiary referral clinic, so the true prevalence in the population could be even higher (Fritz et al. 1997).

Somatization with normal daily function is a rather common phenomenon in children and adolescents, but in more difficult cases can complicate normal psychosocial development. Somatization can also indicate other underlying problems, such as psychiatric disorders, psychosocial stress, and somatization in the family. Somatization, depression, and affective disorders show considerable co-morbidity. In longitudinal studies, highly somatizing adolescents with somatic complaints have exhibited symptoms of depression and/or panic attacks, which gradually progress to major depression during follow up (Garralda et al. 1999, Craig et al. 2002). The somatic symptoms of depression and anxiety, like palpitation, dizziness, tiredness and lost appetite, may precede depressive and affective symptoms (Craig et al. 1993). Highly somatizing patients are at higher risk for developing major depression later on (Zwaigenbaum et al. 1999). Somatizing may as well be related to personality disorder in adulthood (Bass et al. 1995).

Although the role of inheritance remains inconclusive, somatizing seems to run in families. The model of parental inappropriate expression of illness and the somatization of a child is strongly associated. Ignoring the emotional needs of a child in a family can reinforce somatizing behavior (Craig et al. 1993). Both children’s early exposure to somatic illness and the severe or fatal illness of a parent can also predispose a child to somatizing (Hotopf et al. 1999, Stuart and Noyes 1999). In the present study, three of nine children had suffered previous illnesses and undergone somatic care procedures preceding vertigo. Most of the information about parental health in this study was unavailable.

Adolescents with a history of physical or sexual abuse are more likely to report somatic complaints. Somatizing and life-event disappointment, crises and psychological trauma are strongly associated. Somatizing patients may poorly identify psychological symptoms of emotional arousal and fail to appropriately neutralize disappointments (Zwaigenbaum et al. 1999). In the present study, the two patients who were hospitalized in psychiatric care had a history of sexual or physical abuse.
7 CONCLUSIONS AND FUTURE IMPLICATIONS

7.1 CONCLUSIONS

SOC served to measure means of adapting in patients with symptoms of MD. A higher SOC score represented better adjustment to MD and better quality of life than did a lower SOC score. A high SOC score associated with positive attitudes toward the illness despite ongoing symptoms. Patients with a low SOC score had more emotional distress, symptoms of anxiety and depression, which manifested as low contentment to life, lower self-efficacy and a locus of control depended on others.

Psychiatric symptoms were common in a population of vertiginous patients. Psychiatric symptoms were detected in 68% of the subjects. The most prevalent problem of our subjects was the features of personality disorder; in 63% of subjects, of which the obsessive-compulsive PD was the most prevalent. Of the subjects, 19% had symptoms of depression with considerable comorbidity with symptoms of anxiety. The subjects in the study had suffered from symptoms of vertigo for more than one year, which may explain the lower prevalence of symptoms of anxiety (12%) than in previous studies. PD did not interfere with normal functional capacity unless it was comorbid with symptoms of depression and anxiety. Neither reasons for nor symptoms of vertigo seemed to play a significant role in determining disability.

The prevalence of psychogenic vertigo in children and adolescents examined in an ENT clinic due to symptomatic vertigo was 8%. Patients with psychogenic vertigo found their clinical picture to be more debilitating and to interfere more with their normal daily functions than did patients with vertigo of somatic origin. Depression was the most common disorder, followed by somatization. Unfortunately, little is currently known about the prevalence and characteristics of vertigo in children, especially the role of psychosomatics.

7.2 FUTURE IMPLICATIONS

Vertigo is one of the most frequent complaints in primary care. Symptoms of vertigo are usually self-limited and benign with full recovery. In many cases, however, spells of vertigo recur leading to impairment and chronic outcomes. A number of studies have documented a high prevalence of psychiatric comorbidity in vertiginous patients. Vertigo symptoms
themselves can provoke psychological distress. Recurrent unpredictable attacks can induce fear of losing control, concern about serious illness, and worry about severe attacks compromising one’s ability to adapt. Recurrent spells of vertigo can also provoke previous mental problems. The degree of subjective handicap and emotional distress has shown little relation to the severity of vertigo symptoms. Psychiatric disorders do not cause vertigo, but together with vertigo symptoms can lead to persistent complaints. Anxiety and depression are the most common disorders linked to vertigo. Psychiatric symptoms seem to affect the course of vertigo in a more debilitating and disabling direction. Psychiatric symptoms should be evaluated and diagnoses assessed in cases of chronic and debilitating vertigo. Finding suitable measures to distinguish psychiatric comorbidity is vital. These patients may benefit from structured treatment that deals with controlling their symptoms of vertigo and relieves any distress involved. More information is needed about different treatment regimens, including drug therapy and psychotherapy in vertiginous patients.

Vertigo in children is common and usually involves organic causes. Psychiatric etiology is investigated only after organic etiology is compromised. Psychosomatic symptoms are common in children and adolescents, often reflecting problems in their psychosocial background. Their psychosocial problems usually affect their functioning in daily life. Children with vertigo and balance problems usually receive their care in primary care. However, because little is known about the psychosomatic backgrounds of vertiginous children, further investigations are needed to develop a structured approach to this problem. Most disabled children need a multidisciplinary team, including a psychiatrist.

The results indicate that a high sense of coherence (SOC) better represents contentment in life and less psychological distress despite the chronic disease. Although SOC scores showed no association with severity of illness, subjects with low SOC scores exhibited more symptoms of both vertigo and psychological distress than did subjects with high SOC scores. Symptoms of MD restrict daily living, which impacts on quality of life. These psychosocial consequences are more likely linked to emotional vulnerability than to symptoms of vertigo. SOC seems to help to define emotional distress resulting from chronic disease. However, identifying the forms of support and therapy needed to empower patients under sustained stress will require more information.
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