Licentiate thesis

A comprehensive nurse-led intervention for patients with peripheral vestibular disorders: the feasibility and benefits

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ABSTRACT

Dizziness and balance problems are common symptoms at all ages, the symptoms are more common in women than in men and increases with age. Several studies clearly demonstrate that peripheral vestibular disorders symptoms may lead to the patients reporting functional consequences of a physical, mental and social character. The overall aim of this thesis was to investigate the efficacy and feasibility of an intervention for patients with peripheral vestibular disorders that contains patient education in groups in combination with individual support. The study is a randomized controlled trial (RCT). Thirty-six patients participated in the study: the intervention group (n = 18), who received the intervention and standard care, and patients in a control group (n = 18), who received standard care. The intervention includes a patient education program and individualized nursing support during a six-month period. Outcomes were collected by self-assessment questionnaires about dizziness-related symptoms, well-being, sense of coherence, and self-care measured at baseline before randomization and at six and nine months later. All patients were also instructed to complete a diary where they recorded symptoms that arose during an episode of dizziness. The main results show that the patients who received the intervention rated statistically significant fewer vertigo-related symptoms and a higher sense of coherence than the control group at the nine-month follow-up. The intervention was feasible and seems to support the patients to manage symptoms. The effects were small and must be considered in relation to the efforts of the intervention. Confirmative studies are warranted.
LIST OF PUBLICATIONS

This thesis is based on the results from the following papers:

I. **Faag, C., Bergenius, J., Forsberg, C. & Langius-Eklöf, A.**
   Feasibility and effects of a nursing intervention for patients with peripheral vestibular disorders (Submitted)

II. **Faag, C., Bergenius, J., Forsberg, C. & Langius-Eklöf, A.**
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<table>
<thead>
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<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>BPPV</td>
<td>Benign paroxysmal positional vertigo</td>
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<td>HI</td>
<td>Health Index</td>
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<td>MD</td>
<td>Ménière’s disease</td>
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<td>PVD</td>
<td>Peripheral vestibular disorders</td>
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<td>RCT</td>
<td>Randomized controlled trial</td>
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<td>SEIQoL-DW</td>
<td>The Schedule for the Evaluation of Individual Quality of Life-Direct Weighting</td>
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<td>SCQ</td>
<td>Self-Care Questionnaire</td>
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<td>SOC</td>
<td>Sense of Coherence</td>
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<td>VN</td>
<td>Vestibular neuritis</td>
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<td>VR</td>
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APPENDIX 1
INTRODUCTION

As a nurse working in the Ear Nose and Throat Clinic, I have met patients suffering from dizziness and balance problems which originate from the peripheral vestibular system, i.e. the inner ear and/or the vestibular nerve. Peripheral vestibular disorders (PVD) can have various causes and an exact cause can be difficult to establish. These patients were seldom quite young, and I saw how scared and worried they were. For most patients, it was important to ascertain the causes of the PVD. The available treatment would not always cure but could release the symptom burden for the patients. During my time at the clinic the patients received excellent medical support and treatment, but the nursing care was nearly invisible. I hypothesized that nursing support involvement and giving the patients further knowledge about the disorder may encourage the patients to learn to handle life with a PVD. Patient education is one important area within the nursing profession, but it was not provided for these patients at that time. Therefore this is an area I wanted to further investigate.
BACKGROUND

Dizziness

Origin
Dizziness is a symptom that may arise at any age and can be acute or chronic, although most often it will disappear spontaneously. However, when it is persistent it might originate from the vestibular or central nervous systems, or it could be defined as having psychiatric causes related to psychosocial problems (Holmes & Padgham, 2011). Although the cause of dizziness is often benign, it is necessary to differentiate it from neurological conditions (Luxon, 1997; Holmes & Padgham, 2011).

The term vertigo is often distinct from dizziness and refers to a dysfunction within the peripheral vestibular system, and might be seen as a severe form of dizziness. Vertigo is characterized with a clear sensation of rotation (Neuhauser, 2007). Peripheral vestibular disorders (PVDs) are conditions which stem from the inner ear, and the vestibular nerve which controls balance (Ishiyama, Jacobson & Baloh, 2000; Karatas, 2008; Yardley, Beech, Zander, Evans & Weinman, 1998; Yin, Ishikawa, Wong & Shibata, 2009). The three characteristic symptoms of PVD are: vertigo, lightheadedness and giddiness, and feeling unsteady (Neuhauser, 2007).

Prevalence
Dizziness is common in the adult population; a systematic review reported that a lifetime prevalence estimates significant dizziness ranging between 17 and 30%, and for vertigo between 3 and 10% (Murdin & Schilder, 2014). Some authors report that PVDs accounts for approximately 40–65% of those seeking help for dizziness (Bath, Walsh, Ranalli, Tyndel, Bance, Mai, & Rutka, 2000; Neuhauser et al., 2008).

Most common disorders
The most common PVD seen in clinical practice are benign paroxysmal positional vertigo (BPPV), Ménière’s disease (MD) and vestibular neuritis (VN) (Gacek, 2013; Wipperman, 2014). Dizziness symptoms are more common in women than in men and increases with age (Mendel, Bergenius & Langius-Eklöf, 2010; Murdin et al., 2014).

Benign paroxysmal positional vertigo
A person with BPPV has brief periods of vertigo (lasting less than one minute) which occur in conjunction with a change in position, or a short dramatic dizziness associated with specific head movements (Salvinelli et al., 2004). Most often this is associated with head movements when lying in bed. The cause of BPPV appears to be caused by loose particles in the posterior semicircular canal, treated with repositioning maneuvers designed to relocate loose particles from semicircular canals, into the utriculus where they no longer causing vertigo on movement of the head (Furman & Cass, 1999; Salvinelli et al., 2004). The well-established Epley maneuver is a safe, effective and common treatment for BPPV (Lopez-Escamez, Gamiz, Fernandez-Perez & Gomez-Finana, 2005; Hilton & Pinder, 2014). Long-term
recurrence of BPPV is common as up to 36% of the patients experienced symptom recurrence over a 48-month period after successful initial treatment with the Epley maneuver, although research evidence on this subject conflicts and is based on only few small trials (Hilton et al., 2014).

Ménière's disease

Ménière's disease (MD) is a disease originating from the inner ear that causes symptoms from both the balance and hearing organ. Symptoms at MD are frequently present with vertigo in combination with unilateral tinnitus, a feeling of pressure or fullness in the same ear and hearing loss, severe nausea or vomiting (Salvinelli et al., 2004). The dominant theories of the origin of MD is an excess of fluid, endolymph, in the inner ear. Endolymphatic hydrops (EH) is the most evident and recurrent histologic finding in MD. This has led to the widespread hypothesis that hydrops generates the clinical symptoms of this illness. Many factors have been proposed as leading to EH. These have included decreased endolymph absorption (via diminished function of the endolymphatic duct and sac), overproduction of endolymph, or a combination of both. Decreased endolymph absorption is the most investigated supposition (Merchant, Rauch & Nadol, 1995; Dunnebier, Segenhout, Wit & Albers, 1997). The link to stress is common in many patients having MD (van Cruijsen, van de Wie, Wit., & Albers, 2006). If the disease worsens, then hearing loss might progress and recurrent hearing loss is a well-known symptom of MD (Junicho, Aso, Fujisaka & Watanabe, 2008). Medical treatment of the disease usually aims to reduce the endolymph in the affected balance organ. Studies have suggested that there is no relation between the use of diuretics and MD, but it is still offered to all patients because diuretics are a fairly safe option. Patients are also told to try a salt-free diet. Most patients can improve through a combination of pharmaceuticals, psychological counselling, lifestyle and dietary changes such as regular working hours, regular sleep, exercise, and a mental and physical stress-free lifestyle (Sajjadi & Paparella, 2008; Söderman, Möller, Bagger-Sjöbäck, Bergenius & Hallqvist, 2004). If this fails, surgery may be considered, specifically endolymphatic sac surgery. The surgery decreases the buildup of endolymphatic pressure by removing petrous bone that encases the endolymph reservoir (Sajjadi et al., 2008; Bergenius, 2007). This allows the reservoir sac to expand more freely than before and allows the pressure to dissipate. In addition, some surgeons insert a drain or valve from the endolymphatic space to the mastoid or subarachnoid space to reduce pressure further (Sajjadi et al., 2008).

Vestibular neuritis

Vestibular neuritis (VN) is believed to be caused by a viral infection of the nerve which causes a severe vertigo. Most often it has a sudden onset which causes a rapidly growing feeling of sharp carousel vertigo and nausea, and this often causes vomiting (Strupp & Brandt, 2013). Other obvious symptoms are difficulty walking without assistance, severe fatigue and vision problems including difficulty with focusing (Strupp et al., 2013). Any head movement increases the symptoms, and during the first week the patient may needs help getting to and from the toilet and with providing the body with fluids and salts. Often VN causes hospitalization for up to several days to treat nausea and provide fluids and this can last for
weeks with rest-symptoms. Vestibular exercises to improve compensation and Cortisone therapy has been recommended for these patients (Strupp et al., 2013).

**Living with peripheral vestibular disorders**

In many cases it is not possible to fully cure PVD conditions because the disease is recurrent, or there is a lack of or insufficient vestibular compensation. Some patients will eventually improve after onset and other have to live with it all their lives. Some patients are referred to physiotherapists for vestibular rehabilitation (VR) or psychiatrists for support in combination with the medical treatment. One of the pioneering studies about the consequences of having PVD was from the patients’ perspective and described their vulnerable life situations (Mendel, Lützén, Bergeniaus & Björvell, 1997). The study described how they felt, how they tried to find ways to carry on day-to-day, and highlighted their need for information and continuity of care. Several studies clearly demonstrate that PVD symptoms may lead to the patients reporting functional consequences of a physical, mental and social character (Mendel, Bergeniaus & Langius, 1999; Söderman, Bergeniaus, Bagger-Sjöbäck, Tjell & Langius, 2001; Nazareth, Landau, Yardley, L & Luxon, 2006; Neuhauser, Radtke, von Brevern, Lezius, Feldman, & Lempert, 2008; Holmes et al., 2011). Furthermore, psychiatric co-morbidity with anxiety and depressive symptoms has been reported as overrepresented, especially in Ménière's disease (Eagger, Luxon, Davies, Coelho & Ron, 1992; Eckhardt-Henn, Breuer, Thomalske, Hoffmann, & Hopf, 2003; Eckhardt-Henn, Best, Bense, Breuer, Diener, Tschan & Dieterich, 2008). The level of severity of handicaps, psychosocial function, anxiety and depression could be explained by the patients’ overall ability to cope, defined as the degree of a sense of coherence (SOC) in life, and not solely by the degree of vertigo symptoms (Mendel et al., 1999). The most difficult symptoms mentioned by the patients in addition to vertigo were nausea, headache, vomiting, loss of concentration or memory and fatigue (Mendel et al., 1999). Furthermore, several patients gave descriptions of how they often or always had to stop whatever they were doing during an attack of dizziness. When asked what the patients experienced as the worst to live with, they answered that vertigo led to the most restrictions in social and leisure activities and the ability to move around quickly, as well as a loss of confidence and it increased their worry and fears (Mendel et al., 1999).

**Intervention studies to promote symptom burden in PVD**

Intervention studies aiming to support patients to handle the symptoms and consequences following PVD are few and evidence-based information is scarce, but the majority indicates vestibular rehabilitation (VR) is favourable as it improves symptoms burden and dizziness-related handicaps, as well as increasing postural stability especially in patients with severe vestibular dizziness (Yardley et al., 1998; Yardley, Donovan-Hall, Smith, Walsh, Mullee & Bronstein, 2004; Bjerlemo, Kollen, Boderos, Kreuter & Möller, 2006; Enticott, Vitkovic, Reid, O'Neill & Paine, 2008; Giray, Kirazli, Karapolat, Celebisoy, Bilgen & Kirazli, 2009). However Yardley et al. (1998) concluded that the improvement was modest and suggested combining VR with group support. Neatherlin & Egan (1994) suggested that nurses preferably in a multidisciplinary team, should educate patients with BPPV about various interventions and lifestyle changes to diminish symptom burden and support patients and their relatives about how to live with dizziness (Neatherlin et al., 1994).
Patient education

Patient education is defined as a process which occurs over time, requiring an ongoing assessment of the patient’s knowledge, attitudes, and skills (Rankin, Stallings & London, 2005). The patient should be viewed as a learner, and patient education ought to support the patients to achieve preparedness to manage a disease (Friberg, Pilhammar Andersson & Bengtsson, 2007). Patient education is considered an important aspect in nursing and an important part of the nursing profession (Friberg et al., 2007). A nurse who educates patients must her/himself be well-educated and have the communication skills to teach. When the nurse is teaching, it is important that the patient is involved. Otherwise there are risks that the patient will become a passive agent. Education needs to be planned with a clear structure and clear goals (Fossum, 2013). The focus in most educational interventions is problem-solving and that the patients have learned to set up self-care plans (Loveman, Royle & Waugh, 2003; Smith, Herndon, Lyerly, Coan, Wheeler, Staley & Abernethy, 2011). Behavioral treatment is also a model used in some studies where teaching focuses on both giving knowledge and changing the patients’ attitudes to their functional disability and depression. As a complement to an instructional component, interventions could also include exercise, biofeedback or psychosocial supports (Riemsma, Kirwan, Taal & Rasker, 2003). In self-care education, the communication is paramount foundation and it is important to support the change of habits in the care of patients with chronic disease. It requires a combination of different methods and treatments to best support these patients to have a healthy perspective and make the necessary life changes. Patients should be involved and take responsibility for their own care and treatment and the health professionals’ role is to take actions that support the patient in this process (Klang Söderkvist, 2014).

Designs of patient education

There are several different ways to design educational interventions: in groups, individually or in combinations of both (Rankin et al., 2005; Danielsen, Burcharth & Rosenberg, 2013). The design of patient education differs and the length of education activities can vary. They can range from very short-term education focusing on preparing patients for emergency surgery to education with the intention to support patients with longer lasting illnesses through knowledge about the disease, treatment and managing self-care (Reynolds, 2009; Johnson, Gamarel & Dawson Rose, 2006). Some education runs from about a month to up to six months and some longer than six month (Cho, Yoo & Kim, 2006; McGillion, Watt-Watson, Stevens, LeFort, Coyte & Graham, 2008; Theander, Jakobsson, Jörgensen & Unosson, 2009; Vincent, Pasvogel & Barrera, 2007; Yip, Sit, Fung, Wong, Chong, Chung & Ng, 2007).

Group education

Group education is mostly organized with the main purpose of increasing patients’ knowledge about the disease and how to handle treatment and with the ultimate goal of enhancing self-care. Education in groups is often on-going during a specified time period which has a number of sessions that feature different topics run by different professions. One example which is widely used is group education interventions for patients with heart or lung diseases
In a study with coronary heart disease (CHD) the patients received a 2-hour education session that included an introduction to the heart and CHD, risk factors, diagnostic investigation and treatment. The patients also got a booklet about cardiac rehabilitation and 8 weekly sessions of general education about exercise. The results showed positive effects on patients exercise behavior and positive effects on reducing the frequency, severity and duration of the patients’ angina (Zhu et al., 2014). Another example is group education for patients with chronic obstructive pulmonary disease (Theander et. al., 2009). This education group was multidisciplinary and was implemented two days per week for 12 weeks with each session lasting one hour. The patients who received this education had statistically significant improvements in a six-minute walking distance after 12 weeks. At a follow-up 12 weeks later it turned out that the change was not sustained (Theander et. al., 2009). The advantages with group education are that it allows the patient to feel less alone as they can share each other’s experiences (Klang Söderkvist, 2014; Rankin et al., 2005; Klug Redman, 2006). On the other hand one disadvantage may be that some participants will not ask questions in large groups (Rankin et al., 2005). It is important to ensure that the group learns similar content simultaneously, and it is thought that it is easier to customize the education if everyone in the group shares common basic knowledge and skills (Rankin et al., 2005; Pilhammar Andersson, 2007).

**Individual education**

Individual education can include written materials handed out to the patients (Rankin et al., 2005) or telephone calls, which work especially well when the patient has reading difficulties (Effing, Monninkhof, van der Valk, Zielhuis, Walters, E., van der Palen & Zwerink, 2007; Haines, Gross, Burnie, Goldsmith, Perry & Graham, 2009). Individually-designed education can be organized by one professional, not seldom perfect for the nursing profession (Rankin et al., 2005). The nurse educates the patient with immediate feedback and misunderstandings can therefore be corrected. Individual education is often effective as it is personalized. To be most effective, a follow-up meeting are suggested (Frich, 2003; Suhonen, Välimäki & Leinon-Kilpi, 2008). Individual education is commonly seen in studies for patients with cancer. One study on individualized intervention included training and counseling, as well as audio-visual and computerized educational materials which were given to each patient with the goal to improve the perception of fatigue (Godino, Jodar, Durán, Martinez & Schiaffino, 2006). The patients were given a diary where they could write down their feelings related to fatigue on a daily basis. The results revealed that the patients in the experimental group who received the intervention decreased their level of fatigue compared to the group of patients that did not receive this intervention and whose fatigue level increased during treatment (Godino et. al., 2006). Another study applied an individual educational intervention with the goal to improve pain management among patients with cancer (Yates et al., 2004). The first session, 30 minutes in length, was administered in the outpatient department. The second, 15 minutes in length, was administered by telephone 1 week later. A booklet entitled “Managing Cancer Pain” was used to provide structured information and reinforce behavior change. This study showed that this intervention may result in lower levels of anxiety over time but not for measures of pain intensity, pain impact, or quality of life (Yates et al., 2004). A systematic
literature review of individual education interventions for patients with neck pain did not resulted in any effects after the interventions (Haines et al., 2009).

**Group education with individual education**

Group education together with individual education can be combined so that group education is followed up with individual meetings where the patient is given the opportunity to ask specific questions which are relevant for her/him (Wattana, Srisuphan, Pothiban & Upchurch, 2007). Individualized education that includes follow-ups is suggested to be preferable (Klang Söderkvist, 2014). If a patient does not want to ask questions in a large group during group education the nurse could follow-up individually. This would offer the patients the opportunity to ask questions, and the nurse could evaluate their understanding and further help them to apply the training to his or her specific situation (Rankin et al., 2005). A behavioral management program for patients with heart failure consisted of four classes which focused on heart failure and behaviors related to heart failure followed by three individual phone calls over a 4-month period (Shively et al., 2005). The study showed significant improvements in self-reported health-related quality of life over time compared to patients in a control group. However, there were no group differences between the intervention and control patients in exercise performance, physical functioning, mental function or general health perceptions (Shively et al., 2005). In one study that included patients with diabetes, group education was followed by individualized meetings about how to promote self-efficacy in managing diabetes. This education included meal planning, appropriate physical activity, proper use of medicine, monitoring for signs and symptoms complications. The education was designed with a small group diabetes education class (120 min), four small group discussions (90 min/group), two individual home visit sessions from the researcher (45 min), and a patient education manual (Wattana et al., 2007). The results showed that the patients in the experimental group improved in blood glucose, total cholesterol and blood pressure levels and quality of life compared to patients in the control group.

**Summary**

Patient education can be provided through group education, individual education and group education with individualized education. The purpose of the education programs varies between different designs and different diseases, but similar content can focus on enhancing self-care and knowledge about the disease. The measurement outcomes usually consist of disease parameters, self-care activities and quality of life indicators. The main effects occur in terms of increased quality of life, such as for patients with heart disease and improved blood glucose levels and increased self-care for patients with diabetes. The heterogeneity in design of interventions, study populations, follow-up time, and outcome measures together with the evidence that the efficacy of education interventions is scarce indicates that more evidence is needed for designing education programs which could achieve best the outcomes from the patients’ perspectives. However patient education in its different forms does not seem to be harmful. It is stated that there is a need for randomized control trails (RCT) with long-term follow-ups, before generalized conclusions about the effects of patient education can be drawn (Frich, 2003; Foster, Taylor, Eldridge, Ramsay & Griffiths, 2007; Effing et al., 2007).
RATIONALE

Peripheral vestibular disorders (PVD) are common in all ages and it’s not always curable. Thereby it is a condition that may be long-lasting and sometimes for life. Patients who have PVD feel vulnerable and emphasize the importance of assurance from health care professionals and need support from the health care system. They describe needing for confirmation and long-lasting convalescence of symptom burden, and they state that PVD causes emotional distress and impacts on their physical, mental and social functioning. The patients also require more information, support and continuity of care in order to cope with their situation. From the patients’ perspectives, there is an obvious lack of care and support beyond their visits to the physician. Intervention studies of patients with PVD are scarce and mainly consist of VR and the effects are not clear. In other areas group education in combination with individual education has shown more promising results. It still remains unclear about how to best support patients to adjust to and live with PVD. With an ultimate goal to enhance care for patients with PVD, we designed an intervention based on studies from other areas and on what patients with PVD have requested in previous studies. As the intervention is complex and demands extra resources, a smaller study was performed as a foundation for a potential full-scale RCT study.

AIM OF THE STUDY

The overall aim of this thesis is to investigate the efficacy and feasibility of an intervention for patients with peripheral vestibular disorders that contains patient education in groups in combination with individual support.

Specific research questions:

1. How does the intervention works with regards to feasibility? (Study 1)
2. What are the effects of the intervention regarding symptoms, anxiety, well-being, sense of coherence, quality of life and self-care ability? (Study 1)
3. How well do the patients’ experiences of dizziness symptoms, recorded in a diary, correspond with a questionnaire developed to measure specific dizziness symptoms? (Study 2)
MATERIAL AND METHODS

Design

The base for the two studies is a randomized controlled trial (RCT). Participants were randomized into two groups, one Intervention group (I-group) and one Control group (C-group). The study followed the Consort-statement (Campbell, Piaggio, Elbourne & Altman, 2012).

The baseline data collection was completed before the randomization. Forty sealed envelopes were prepared with either a note stating I-group or C-group, and these were randomly chosen when a patient gave informed consent (Jadad, 1998). The patients in the I-group received group education and individual nursing support during a six-month period together with routine care, and patients randomized to the C-group received routine care only. Follow-up data was collected six (T2) and nine (T3) months after baseline.
Figure 1. Flow chart Intervention and Control group. Questionnaires Vertigo Symptom Scale (VSS), Health Index (HI), Sense of Coherence (SOC), Self-Care Questionnaire (SCQ), The Schedule for the Evaluation of Individual Quality of Life-Direct Weighting (SEIQoL-DW). Twenty patient chose to keep diaries, of whom 10 belonged to the I-group and 10 to the C-group.
Sample
Patients were recruited from 2000 to 2002 from a specialist at the Department of Audiology at a university hospital. To be included in the study, patients had to meet the following criteria: i) a peripheral vestibular disorder, diagnosed by a specialist in neurotology; ii) sufficient knowledge of the Swedish language; iii) physical and mental ability to answer the questionnaires; iv) age over 18 years, v) living in Stockholm County; and, vi) patient had had at least three spontaneous attacks of, vertigo and/or had been almost constantly unsteady during the last 3 months for at least 75% of the time when awake. Patients who met the inclusion criteria were asked if they wanted to participate in the study, and when informed consent was obtained they answered the baseline measures and thereafter they were randomized into a group. In total, 52 patients fulfilled the inclusion criteria; 40 accepted participation in the Study 1, and 18 in each group (I-group, C-group) filled out the questionnaire on all three occasions. The patients who chose to participate in the study but then chose to decline did this at T1 (Figure 1). The 12 drop-outs were 3 men and 9 women with a median age of 63 (range 40-86) years. The reason for drop-out for most patients was related to not having enough time to participate in an intervention. Twenty patients out of the total sample (n=36) kept diaries during the study period, of whom 10 belonged to the I-group and 10 to the C-group and thereby constitute the sample for Study 2.

Routine care (C-group)
Routine care in PVD mainly includes medical treatment when appropriate. BPPV is mainly treated with the Epley Maneuver, in which loose particles in the posterior semicircular canal of the inner ear is repositioned into the utriculus where they are inactive, in a series of head positions (Lopez-Escamez et. al., 2005). The most common treatment for MD is reducing the excess of endolymphatic fluid (hydrops) causing the attacks of hearing loss and vertigo through the use diuretic pharmaceuticals (Sajjadi et al., 2008) and VN is treated symptomatically (e.g. with antiemetics), followed by VR. Irrespective of diagnosis but depending on symptom severity the patients are scheduled for follow-ups to the specialist physician or to other professionals for balance training or emotional support (e.g. physiotherapists and psychiatrists). Follow-ups, mainly to the physician, are based on individual need.

The Intervention
The intervention was carried out at the same university hospital where the recruitment took place.

The intervention was built on two integrated parts, a group education program and individual support from a specialized nurse allocated for the study.

I. Group education
A group education program was offered for 5, 2-hour sessions; the first three sessions took place within two weeks and were followed by a session every two weeks. The education program lasted for 6 weeks. The group education program was given at two separate
occasions, with nine patients in each round. Every education session started with a lecture on the topic of the day followed by discussion time with the lecturer, and to share each other’s experiences. The group education was offered to both patients and their relatives. The group leader (i.e. the specialist nurse) was present at all sessions to encourage a sense of belonging and security and to highlight the benefits of meeting others with similar experiences.

**Session 1.** The session started by introducing the participants. This was followed by a specialist physician in audiology who gave general information about physiology, diagnoses, prognosis and symptoms of PVD, and then a specialist nurse gave information about what it can be like to live with dizziness.

**Session 2.** A physiotherapist introduced different exercises for balance training and relaxation. During the session the participants were also given the opportunity to practice these exercises.

**Session 3.** A psychiatrist lectured about emotional distress and discussed how to handle illness and how to support each other.

**Session 4.** This session was held by the same specialist physician from session 1 but who now focused on answering participants’ questions.

**Session 5.** A social worker informed the group on practical matters, such as sick leave, patient associations and other support functions in the community.

## II. Individualized nursing support

The patients had access to individualized nursing support during the six-month intervention period. The nurse was assigned to the study and offered visits at the clinic or telephone contact with the patients based on their needs and on their initiative. The nurse provided support and encouragement during daytime weekdays, and the meetings took place at the clinic.

## Outcomes

The decision to use a wide range of questionnaires was based on the purpose of the study, which was to investigate the feasibility of the intervention and to explore potentially sensitive outcomes. Finding from previous studies have shown that patients with PVD had high symptom burden, increased emotional distress and it also influenced wellbeing. Overall findings were that they were in need of support. Therefore it was decided in the current study to include questionnaires which focused on all of these areas. Furthermore, earlier studies have shown that the patients’ degree of sense of coherence (SOC) could predict the severity of consequences from PVD (Mendel et al., 2001; Söderman et al., 2002). The choice of questionnaires was based on those used with patients with PVD in earlier studies and which have been shown to be reliable, valid and applicable (Mendel et al., 1999; Söderman, Bagger-Sjöbäck, Bergenuis & Langius, 2002; Yardley et al., 2004).
Measurements for Study 1

All outcome measures were collected before the intervention (baseline, T1), at the end of the intervention (6 months after baseline, T2) and 3 months post-intervention (9 month after baseline, T3) (Figure 1). Five questionnaires were included: four were self-administered and one was based on a semi-structured interview. The latter was only applied at T1 and T2. Questions asked about demographic data (working status, civil status and educational level) and duration of vertigo. Clinical data was collected from the patients’ medical records. The patients in the I-group were asked to answer a questionnaire after the last group-education session about each of the 5 sessions, to rate them as good or less good. There was also an opportunity to leave comments for each session. The number of visits (at the clinic or by telephone) to the nurse in the I-group was recorded.

1. The Vertigo Symptom Scale (VSS) was originally developed by Yardley and has thorough psychometric testing (Yardley, Masson, Verschuur, Haacke, & Luxon, 1992). The VSS has been translated, tested and revised for Swedish use (Mendel et al., 1999, appendix 1). The scale includes 22 symptoms divided into two sub-sets of symptoms: Vertigo Severity (7 symptoms) and Somatic Anxiety (15 symptoms). The Vertigo Severity sub-set includes three descriptors of dizziness (feelings about things spinning or moving around, light headedness and unsteadiness) rated for duration, altogether clustered into three scales: Short (range 0-12), Medium (range 0-24) and Long (range 0-12) duration of vertigo (Mendel et al., 1999). A high score on the VSS scales represent more frequent vertigo-related problems. The Swedish version was also extended with two single items based on clinical experience which concerns the feeling that the surrounding world is tilting (range 0-4) and the feeling that the ground is distant, shaking or you feel like you are walking on clouds (range 0-4) (Mendel et al., 1999). In the present study Cronbach’s alphas in both groups and over time ranged from 0.87 to 0.91.

2. Health Index (HI) was developed and tested in Sweden (Forsberg & Björvell, 1993). It measures general well-being in terms of nine items: energy, temper, fatigue, loneliness, sleep, dizziness, bowel function, pain and mobility. Each item has a verbal category scale format ranging from 1 to 4 with four response alternatives (very poor, poor, good and very good). The items are summarized in an index, with a possible total score ranging from 9 to 36; higher scores indicate better perceived general health (Forsberg et al., 1993). Cronbach’s alphas in the present study ranged in both groups and over time respectively 0.63-0.89.

3. Sense of Coherence (SOC) scale was developed by Antonovsky and measures overall ability to manage stressful situations (Antonovsky, 1993). The concept of SOC is defined as an individual’s global view of life based on how comprehensible, manageable and meaningful life appears to him or her. The scale was developed to measure SOC and is well-tested; it consists of 13 items (Antonovsky, 1993; Eriksson & Lindström, 2005; Eriksson & Lindström, 2007). The more apparent these abilities are, the higher is a person’s degree of SOC. The items are rated on a seven-point scale with two anchoring responses, giving the scale a range of scores from 13 to 91, with higher scores indicating a higher degree of SOC. In the present study Cronbach’s alphas in both groups and over time ranged from 0.74 to 0.92.
4. **Self-Care Questionnaire (SCQ)** was developed for the present study, inspired by the Diabetes Empowerment Scale (Anderson, Funnell, Fitzgerald & Marrero, 2000) and further developed locally at the hospital where the study took place (Wredling unpublished data, personal communication). In the present study the condition of diabetes was replaced by dizziness. The questionnaire consists of 29 items (scored from 1 to 4) that are divided into four scales:

a) **Social support** (6 items, range 6-24 points; example of an item: “If I needed support and help I always have someone to turn to”)

b) **Participation** (6 items, range 6-24 points; an example of item: “I feel convinced that I know enough about my dizziness to be able to make some choices after recommendations from my doctors or nurse”)

c) **Confirmation** (11 items, range 41-66 points; an example of item: “They listen to me and my thoughts”)

d) **Satisfaction with care** (6 items, range 6-24 points; an example of item: “Able to meet the same nurse at each visit”).

Cronbach’s alphas were above 0.70, except for the scale Participation (0.46), at all-time points and were therefore not included in the results.

5. The **Schedule for the Evaluation of Individual Quality of Life-Direct Weighting (SEIQoL-DW)** is a semi-structured interview-based instrument originally developed to measure individualized general quality of life (QoL) (Hickey, Bury, O'Boyle, Bradley, O'Kelly & Shannon, 1996; Browne, O'Boyle, McGee, McDonald & Joyce, 1997; Waldron, O'Boyle, Kearney, Moriarty & Carney, 1999). In this study a modified and extended version was used that included a disease-specific section (SEIQoL-DR) in combination with the original generic section (SEIQoL-G) (Wettergren, Björkholm, Axdróph, Bowling & Langius-Eklöf, 2003). Before conducting the interviews, the interviewer (the author) was trained in the technique. The interviews contain a two-step procedure for both parts. The general question was: “When reflecting on your life overall, what are the most important things presently, both positive and negative, that are crucial for your quality of life?” The patients then nominate a maximum of five domains that they consider to be the most important in determining their QoL. In Step 2, the level of current satisfaction with each domain is rated by the patient by placing a mark on a vertical scale ranging from 1 (worst possible) to 7 (best possible). The disease-specific section consists of a repetition of the original procedure but with the following question: “If you think about your dizziness, what in your life is influenced, both positively and negatively, by this?” A total score of both sections is calculated by combining the ratings divided by the number of domains (range 1-7), with higher scores indicating higher QoL.
Diaries Study 2
Data collection for Study 2 was conducted in the form of a diary. All patients who participated in the study were asked to keep diary, where they were obliged to record symptoms that arose during an episode of vertigo. The purpose of keeping diaries was to explore the symptoms that patients had on a regular basis. The diary method has been used in studies to investigate daily health symptoms (Heinonen, Luoto, Lindfors & Nygård, 2012) and is particularly common in social research (Alaszewski, 2006). The diaries had an unstructured form where the participants were instructed to write down their symptoms on the first page of a blank book, and were told that they could write down their symptoms on the days they had vertigo during the study period (6 months).

Data Analyses
Study 1
In study 1 statistical analysis was accomplished using SPSS 15.0 for Windows. Differences between the groups at the different time points were determined using the Mann-Whitney U test and differences within the groups by Friedman test. Spearman’s-rank correlation coefficients were applied to analyze relationships between the scores of the questionnaires and duration of vertigo and number of visits. Statistical significance was set to p<0.05 in the study.

Study 2
In study 2 the text is processed with content analysis (Bowling, 2002; Sandelowski, 2001). The material varied with regard to depth and extension. Some patients wrote down the symptoms daily and others summarized longer periods. The content of the patients’ diaries were transformed word for word and then the material was read carefully to make sense of data. All text was carefully analyzed to determine the symptoms that appeared from the material. The symptoms were written down and then categorized into any of the 24 symptoms in the questionnaire VSS (described above, appendix 1). The symptoms that could not be categorized into these items were further analyzed and categorized in subcategories which finally formed the main categories.

ETHICAL CONSIDERATIONS
The studies were approved by the Regional Ethics Committee Karolinska Hospital in Stockholm. The patients were informed about the study verbally as well as in writing. When the patients were invited to take part in the study it was emphasized that participation was voluntary and that treatment would not be influenced by participation or not in the study. The patients were informed that if they chose not to participate in the study they had the same treatment regimen as was routine. With questionnaires there is always a risk that questions may constitute a risk to personal integrity. To ensure confidentiality, all questionnaires were provided with a respondent-specific code number. In the study the patients’ confidentiality
was preserved by use of a patient identification number and this identifying code list was stored in a locked cabinet and kept separate from the questionnaires. The data in the study have been presented in a way that the risk of identification of individuals is minimized. The number of questionnaires (items) included could be considered as a high number and thereby may be a burden for the patients. However, all the patients answered all of the items and there was only a very limited number of missing data. Additionally we did not receive any comments from patients that the number or content of the items caused them burden.

RESULTS

Demographics and medical data

Median age did not significantly differed between the I-group (median 49.0 years, range 28-82) and C-group (median 53.5 years, range 29-75). In addition there was no significant difference in the median number of years having vertigo between the I-group (median 3 years) and C-group (median 1.5 years). There were 11 women and 7 men in the I-group, and 16 women and 2 men in the C-group. Of these 36 patients, 20 chose to write diaries, of whom 10 belonged to the I-group and 10 to the C-group (13 female and seven male). Further demographic and medical data is presented in Table 1.
Table 1. Personal characteristics of the intervention group (I-group n =18) and the control group (C-group n=18) at baseline (percentages, with numbers in brackets).

<table>
<thead>
<tr>
<th>Variables</th>
<th>I-group</th>
<th>C-group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>11 (61)</td>
<td>16 (89)</td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>10 (55.6)</td>
<td>8 (44.5)</td>
</tr>
<tr>
<td>Retired</td>
<td>6 (33.4)</td>
<td>2 (11)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>1 (5.5)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Sick-listed</td>
<td>1 (5.5)</td>
<td>8 (44.5)</td>
</tr>
<tr>
<td>Living situation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/Living together</td>
<td>9 (50)</td>
<td>12 (66.7)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary/Elementary school</td>
<td>3 (16.7)</td>
<td>3 (16.7)</td>
</tr>
<tr>
<td>High school</td>
<td>7 (38.9)</td>
<td>10 (55.6)</td>
</tr>
<tr>
<td>University/College</td>
<td>8 (44.4)</td>
<td>5 (27.7)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ménière's disease</td>
<td>9 (50)</td>
<td>9 (50)</td>
</tr>
<tr>
<td>Vestibular dysfunction</td>
<td>6 (33.4)</td>
<td>5 (27.7)</td>
</tr>
<tr>
<td>BPPV</td>
<td>2 (11)</td>
<td>3 (16.7)</td>
</tr>
<tr>
<td>Unclear</td>
<td>1 (5.6)</td>
<td>1 (5.6)</td>
</tr>
</tbody>
</table>

BPPV, benign paroxysmal positional vertigo
**Differences between the groups**

At baseline (T1) the patients in the I-group more often felt that the world was tilting, and had somatic anxiety symptoms (Table 2). There were no significant differences between the groups at T2. At T3, the patients in the I-group significantly rated less vertigo symptoms with medium duration, somatic anxiety and less feelings that the world was tilting and the ground was distant or shaking than patients in the C-group (Table 2). Regarding the ratings on the HI, SOC, SEIQoL-DR and SCQ scales, there were no significant differences between the groups at T1, T2 and T3. In the semi-structured interviews (SEIQoL-DR) all patients in both groups stated areas affected by their dizziness before the intervention (T1). At T2, 56% (n=9/16 (2 missing)) of the patients in the I-group were still affected by dizziness and in the C-group 82% (n=14/17 (1 missing)).

**Differences and correlations within the groups**

The patients in the I-group significantly rated less vertigo symptoms with short duration at T3 (Table 2) rated better well-being (HI) (p<0.001) and higher degree of SOC (p=0.023). They also rated higher disease-related quality of life (SEIQoL-DR) (p=0.008) at T2 compared to T1 (baseline). The patients in the C-group significantly (p<0.001) rated better well-being (HI) at T3. There were no significant correlation between the time of having vertigo and outcomes in either the I-group or in C-group for all time points. The patient in the I-group that had had vertigo with a longer duration of disease rated higher satisfaction with disease-related quality of life as measured by the SEIQoL-DR (r=0.492, p>0.05).
Table 2. Descriptive and statistical data on the Vertigo Symptom Scale (VSS) in the intervention group (n=18) and control group (n=18) at baseline (T 1), and at 6 (T 2) and 9 months (T 3) after T1. The results are presented in Median (Md) and interquartile range (IQR).

<table>
<thead>
<tr>
<th></th>
<th>Interventions-group</th>
<th>Control-group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T 1</td>
<td>T 2</td>
</tr>
<tr>
<td></td>
<td>Md (IQR)</td>
<td>Md (IQR)</td>
</tr>
<tr>
<td>VSS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short symptom</td>
<td>5.0 (8)</td>
<td>5.5 (8)</td>
</tr>
<tr>
<td>Medium symptom</td>
<td>4.0 (7)</td>
<td>4.0 (8)</td>
</tr>
<tr>
<td>Long symptom</td>
<td>3.0 (5)</td>
<td>0.0 (4)</td>
</tr>
<tr>
<td>Somatic anxiety</td>
<td>19.5 (20)</td>
<td>23.0 (24)</td>
</tr>
<tr>
<td>The world is tilting</td>
<td>2.0 (2)</td>
<td>3.0 (2)</td>
</tr>
<tr>
<td>Ground is distant or quaking</td>
<td>0.5 (2)</td>
<td>1.0 (2)</td>
</tr>
</tbody>
</table>

a) p-value in the intervention group between T1, T2 and T3; b) p-value in the control group between T1, T2 and T3; c) p-value between the intervention group and control group at T1; d) p-value between the intervention group and control group at T2; e) p-value between IG and CG at T3. Differences within the groups over time were analyzed by the Friedman test. Differences between the groups at the three time points were analyzed by the Mann-Whitney U-test.
Applicability of the intervention

Some difficulties arose such as there was a lack of rooms at the clinic; no extra room was available for the nurse, so she had to look for a suitable place to meet the patients before each visit. Furthermore, information given to the physicians about the intervention could have been clearer. In the group education almost all patients attended all five sessions. For the first round of group education, four of the patients brought a relative. For the second round, two of the patients brought a relative. The patients used the individualized nursing support visits/telephone calls, 0-20 times during the 6-month intervention period. Individual meetings or phone conversations often contained support and coaching and lasted between 35 to 65 minutes. The individual support mainly involved listening to the patient’s problems, explaining issues related to diagnosis, encouraging balance training and arranging several appointments for the patient to meet the attending physician. For some patients the nurse also arranged contact with the social worker to support the patient’s social rights or with a physiotherapist or a psychiatrist depending on the needs of the patient.

Satisfaction with the group education

Fifteen patients in the I-group chose to evaluate the education sessions. All sessions were rated with high satisfaction (Table 3). The only suggestion in the open-ended questions was to have more sessions led by the physician.
Table 3. The patients’ satisfaction ratings on the group education (n=15) sessions with the answer options good or less good.

<table>
<thead>
<tr>
<th>Session</th>
<th>Good n</th>
<th>Less good n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Physician/nurse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 2</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 3</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Psychiatrist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 4</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Physician</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 5</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Social worker</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Symptoms described in diaries**

It was found that many symptoms included in the VSS were described by patients in the diaries (Figure 2). The most reported symptoms were a feeling that things were spinning or moving around, nausea (feeling sick), feeling unsteady, headache and a feeling of pressure in the ear.

Symptoms not mentioned by the patients in the diaries but which were items in the VSS were; pain in the heart or chest region, a heavy feeling in the arms or legs, pain in the lower back and excessive sweating (Figure 2). All of these items belonged to the Somatic Anxiety Scale. The patients in the C-group reported a total of 64 symptoms and the I-group reported 52.
Figure 2. The participants’ (n = 20) reported symptoms during an episode of dizziness mentioned in diaries, in relation to the items in the questionnaire Vertigo Symptom Scale (VSS).

**Symptoms described in diaries and not included in the VSS**

The symptoms that were described by the patients in the diaries but were not found in the VSS were sorted in five categories: Emotional distress, Fatigue, Dizziness-related symptoms, Bodily symptoms and Stress. Emotional distress included patients’ description of different emotional reactions, for example worrying about how they would manage going to work, and feelings of anger, sadness, fear and loneliness. Fatigue was represented in different ways such as being totally exhausted, or a sensation of bodily weakness. The category “dizziness-related symptoms” described different symptoms such as tinnitus and, other ear-related symptoms. Other ear-related symptoms that were mentioned were different noises or sensations in the ear. Bodily Symptoms included physical symptoms such as pain in different parts of the body and stiffness, for example in the jawbone, shoulders, neck or legs. Under the category “Stress”, patients mentioned that they were suffering from stress or that they were under stress during an episode of dizziness. Ear-related symptoms and pain were the most frequent symptoms not included in the VSS.
DISCUSSION

In this study, a nurse-led intervention for patients with PVD was evaluated for feasibility and sensitive optimal outcomes to assure an evidence-based implementation prior to a full-scale RCT as suggested for extensive and complex interdisciplinary interventions (Feeley, Cossette, Côté, Héon, Stremler, Martorella & Purden, 2009). Complex interventions are challenging because numerous internal and external components may influence the implementation (Feeley et al., 2009).

Feasibility of the intervention

The feasibility of the intervention was largely implemented as intended. Hellqvist and Berterö (2015) concluded in their study of patients with Parkinson’s disease that both patients and relatives needed specialist nurses to provide individually-tailored support and should include skilled nursing care that relieves the impact of the disease on daily life. In this study we had a nurse with much experience in working with the target group (PVD) but it can be very vulnerable to have only one nurse assigned. Building a therapeutic relationship is significant for the outcome of treatment, and it is important to consider this in future interventions (Muller, Kirby & Yardley, 2014).

Another obstacle for future interventions would be if several nurses (or other professionals) are involved as it demands special training in balance disorders and audiology, counselling and nursing. The role of the nurse in caring for patients who have a complex disorder is multifaceted and collaborative (Neatherlin et al., 1994).

Not all patients used the opportunity to contact the nurse for individual support. The number of contacts varied: four patients did not request any contact with the nurse while one patient had 20 visits. In our design the nurse did not contact the patients, and this could be a suggestion for future studies. Overall, the patients in the I-group were very satisfied with the group education sessions. The only suggestion was to have more sessions led by the physician. Overall, we did not receive any complaints from the participants at therefore, we conclude that the intervention had high acceptability.

Effects of the intervention

The patients in the I-group rated less vertigo-related symptoms at the last follow-up (9 months after the baseline) than the C-group. However, one of the symptom - a feeling of the world tilting was already at baseline different in favour for the I-group which made it complicated to make accurate conclusions. On the other hand an intervention where patients were handed out a booklet about self-management of VR exercises reported fewer vertigo-related symptoms at the one year follow-up in comparison with patients allocated to routine care (Yardly et al., 2012). Interestingly enough, and contrary to what was expected, our intervention had no effect on anxiety, well-being, quality of life or confirmation from health care personnel, satisfaction with care or higher level of participation in care between groups. We analyzed the items in the Self-Care Questionnaire (SCQ) separately, but did not find any pattern that could indicate differences between the I- and C-group (data not shown). Both groups remarkably increased their well-being. The patients in the I-group increased their degree of SOC, although that might indicate that the intervention helped these patients to obtain a better
overall coping ability. The concept of SOC is seen as a rather stable trait that is not sensitive enough to change when temporary fluctuations in life occur (Antonovsky, 1987; Eriksson et al., 2005; Langius-Eklöf & Samuelsson, 2009). Nevertheless, although we cannot conclude whether this change is long-lasting and of clinical relevance, the increased SOC might indicate that the patients in the I-group experienced their life as more comprehensive, manageable and meaningful soon after the intervention.

Methodological considerations

The VSS is one of the most used and tested questionnaires, and it was natural to choose it for the purpose of the present study together with the additional questions as proposed earlier (Mendel et al., 2001). The VSS, especially the Vertigo Severity subscale, seems valid for the present group of patients with manifest PVD during an episode of dizziness, but it might lack some important issues that were not evaluated in this study. Such items were particularly obvious with regard to tinnitus and other ear-related symptoms, which are prominent symptoms in PVD, especially Ménière's disease. Furthermore, symptoms of emotional distress seem more likely to be present during episodes of dizziness in PVD than symptoms of somatic anxiety and have also been found to trigger an attack in Ménière's disease (Söderman et al., 2004). Although the choice to use a wide range of questionnaires was based on examining these multiple categories, the purpose of this study was to investigate potentially sensitive outcomes, and we might have missed there important variables such as emotional distress, perception of stress. Even though we did not specifically measure emotional distress and perception of stress, we feel that we have captured these areas with the SOC-scale. The scale measures a person’s overall ability to handle strain in life and has been showed to correlate highly with emotional distress (Eriksson et al., 2007). A suggestion for the future in order to capture sensitive vertigo-related symptom outcomes is to add items that concern ear-related symptoms and emotional distress and include an open-ended question where the patients can add other symptoms in their own words.

Several factors may have the potential to affect the results of the intervention such as the nurse who provides patient education, how the intervention was designed, purpose, duration, time interval, and the extent of the process. Some of these factors may be more important than others. The choice of using diaries to collect data has both advantages and disadvantages. They are practical to use within small groups (Alaszewski, 2006), however, non-completion is often a problem. This was the case in the present study as 50% of the patients did not keep diaries. Another bias is that the researcher does not have control over whether the patients recorded their symptoms during all episodes of dizziness.

Moreover, in some studies the drop-out rate of participants is a problem. RCTs often suffers from two major complications, i.e., non-compliance and missing outcomes. We had a low level of drop-outs and nearly no missing data in the questionnaires. No power analysis was performed as the study aimed to test the feasibility and explore possible effect ahead of a larger study. Another limitation is the risk of statistical errors depending on the small and diverse sample, and mass significance testing renders a higher risk for producing statistical differences which might not be true. One way to control for this is to sharpen the significance
level according to the Bonferroni test, but it was decided not to do this because error might still occur another way and relevant information may be missing. Of course the results must be interpreted cautiously while keeping in mind that the study was of an explorative nature. There were also a variety of diagnoses in the groups which can influence the results, but the sample size was too small to make any sub-group or multivariate analyses. The appropriateness of RCTs when carrying out nursing interventions has been recognized (Hallberg, 2009). The inclusion criteria do not always reflect clinical reality and therefore interventions are recommended to be directed towards those who could benefit most from them. The nurse (the author) allocated to the intervention also collected data for evaluation in both groups. She also analyzed the data in close collaboration with her supervisor. Ideally a different person should collect and analyze the data to assure no bias towards either treatment. Efforts were made to be neutral and no data was treated before the study was completed. The patients in the C-group with routine care might have been less likely to report subjective improvement if they felt that they had not received active treatment. It is also important to keep in mind that, as the patients in the C-group only received standard care (regular follow-ups with the physician and, when needed, referrals to e.g. physiotherapists and psychologists), the answers to outcome questionnaires could influence potential effects as being an intervention. The patients might be aware of their own symptoms and well-being. The patients were recruited for the study between 2000-2002. This was a number of years ago, and the question is whether the results are valid today. Care for patients at that time is conducted in the same manner today as it was in 2002. The routine care for patients with PVD at the specialist department is the same today and no group education or individualized nursing support is available for patients with PVD hence the medical treatment strategies for this group of patients have not changed considerably since the time of the study.

**Is the intervention worthwhile?**

The main question remains whether it is worthwhile to offer a nursing intervention similar to the present one when the effects were quite small. First, this must be put in the context of other interventions for this patient group. Vestibular rehabilitation (VR) is a form of physical therapy that uses specialized exercises resulting in gaze, posture and gait stabilization. A Cochrane review of 21 randomized clinical trials investigating patients with unilateral PVD reported that almost all the trials included in the review demonstrated that VR was more effective in areas such as balance, vision and gait than other interventions based on education, booklets and relaxation (Hillier & Hollohan, 2007). One study showed that brief sessions with a nurse (individual meetings of about 30 to 40 minutes) that guided the patient through a booklet in conjunction with additional support and advice by telephone significantly reduced symptoms in dizzy patients. However, this reduction in symptoms lasted only 3 months after termination of the treatment (Yardley et al., 2004). Our study found a reduction in vertigo-related symptoms in the I-group at the three-month follow-up but not directly at the end of the intervention. VR should be included in future intervention studies in this patient group in that it has been shown to be helpful in other studies (Hillier et al., 2007; Giray et al., 2009; Patatas, Ganança & Ganança, 2009). The issue surrounding a placebo effect should not be neglected. The patients in the C-group received more attention than in normal standard care by answering questionnaires about their situation that might have helped them to visualize
specific concerns. In a study by Enticott et al., (2008) their C-group improved significantly and the effects remained after six months. The C-group received the same instructions as the I-group about the importance of regular daily exercise and weekly walking. Giray et al. (2009) did not instruct the patients in their C-group to exercise during the study and no improvement in outcomes was seen. Overall, individualized interventions are suggested to be better than non-individualized interventions, although information is limited by the scarcity of research in this area (Suhonen, Välimäki & Leino-Kilpi, 2008). Furthermore, our study indicated no effects in the amount of participation or satisfaction with care. A nurse-led disease management program for chronic kidney disease also failed to show a longer effect of patient satisfaction with care (Wong, Chow & Chan, 2010). Several studies, including ours, have only small groups of patients. One explanation could be that nursing interventions are a cost issue, and expensive to implement in large patient populations (Danielsen et al., 2013). Strömberg (2002) stated that patient education is a field that has much more potential, therefore there is a need for further improvement by combining clinical experience with new technologies. Computer-based education has been found to be a useful tool to complement the education given by health care professionals (Strömberg, 2002). Methods for evaluating patient education also need to be improved. It seems that education needs to be combined with other interventions such as optimized treatment and follow-up in order to be cost-effective (Strömberg, 2002). The compilation results of the literature that has evaluated patient education is consistent in stating that the evidence is scarce on the effects of education as an intervention. Furthermore there are several weaknesses in study designs which also contributes to the lack of evidence.

CONCLUSION

Our findings demonstrate that an intervention combining education and individual nursing support is feasible for patients with PVD. Although there were problems with differences in baseline data and few statistical differences between the I- and C- groups, it is important to consider that the patients who received the intervention may have benefited in that they viewed the world as more comprehensive, manageable and meaningful after the intervention. They perceived their vertigo symptoms as being less frequent, they had fewer issues in areas influenced by the disease and less somatic anxiety in a short-term perspective. The intervention was complex and comprised of both group education and individual support during a six-month period. In the end, the small effects must be related to the efforts of the intervention. Future intervention studies should consider the inclusion of systematic VR in combination with individual support that focuses on strengthening the patients’ ability to manage disease-specific symptoms. There is still a need for larger RCT with long-term follow-ups before conclusions can be drawn on how interventions should be designed for patients with PVD.
CLINICAL IMPLICATIONS

Patients with PVD may experience difficulties that severely affect their life situation. This study indicates that group education combined with individual support can be beneficial to help the patients manage their vertigo-related symptoms. The intervention was delivered by a nurse with specialized knowledge, training and clinical experience. Therefore, education for nurses and other healthcare professionals is warranted to raise awareness of disease management and learn strategies to support patients in self-management, combined with individual support based on each patient’s own needs and preferences. Allowing patients to routinely report their outcomes with standardized assessments could be useful. There is a need to develop a questionnaire that includes the symptoms important to patients with PVD that can be regularly used to collect patient reported outcome data and which also facilitates person-centered care.
SUMMARY IN SWEDISH


Det primära syftet med denna studie var att undersöka effekter och genomförbarhet av en intervention för patienter med perifer yrsel som omfattar gruppendervisning i kombination med individuellt stöd. Ett ytterligare syfte var att undersöka hur väl ett frågeformulär utvecklat för att mäta specifika yrsel symtom (Vertigo Symptom Scale, appendix 1) stämmer med patienternas upplevelser nedskrivet i dagböcker i samband med en yrselattack.

Basen för de två studierna är en randomiserad kontrollerad studie (RCT). Deltagarna randomiserades till två grupper, en interventionsgrupp (I-grupp) och en kontrollgrupp (K-grupp). Patienterna i I-gruppen fick gruppendervisning och individuellt stöd under en sexmånadersperiod tillsammans med rutinmässig vård och patienterna i K-gruppen fick enbart rutinmässig vård. Ett flertal frågeformulär utgjorde utfallsmått: The Vertigo Symptom Scale (VSS) inklusive två extra påståenden som formulerats utifrån tidigare studier och klinisk erfarenhet, Hälso-index (HI), Känsla av sammanhang (KASAM), Self-Care Questionnaire (SCQ) och The Schedule for the Evaluation of Individual Quality of Life-Direct Weighting (SEIQoL-DW). Data insamlades före randomiseringen (T1), sex (T2) och nio (T3) månader senare.

Vid T1 uppgav patienterna i I-gruppen att de oftare kände att omvärlden lutar, och uppgav mer somatiska ångest än patienterna i K-gruppen. Det fanns inga statistiska signifikanta skillnader mellan grupperna vid T2. Vid T3 uppgav patienterna i I-gruppen signifikant mindre yrselsymtom med medellång duration (p=0,023), mindre känsla av att omvärlden lutar (p=0,035) och att underlaget de går på käns gungigt (p=0,017) samt mindre somatisk ångest (p=0,008) än patienterna i K-gruppen. Över tid i I-gruppen uppgav patienterna signifikant färre yrselsymtom med kort duration vid T3 (p=0,049), bättre välbefinnande (p <0,001), bättre hälso-relaterad livskvalitet (p=0,008) och högre grad av Känsla av sammanhang (p=0,023).
Övertid i K-gruppen uppgav patienterna signifikant (p <0,001) bättre välbefinnande vid T3. Patienterna i I-gruppen var i stort sett nöjda med gruppundervisningen. Det enda önskemålet var ytterligare ett tillfälle med läkaren.

Många av de symtom som ingår i Vertigo Symptom Scale (VSS) även beskrevs av patienterna i dagböckerna. De mest rapporterade symtomen var en känsla av att vara vimmelkantig, svimfändig eller få svindel, känsla av ostadighet och illamående. De symtom som beskrevs av patienterna i dagböcker men som inte ingår i VSS sorterades i fem kategorier; Emotionellt, Trötthet, Öron-relaterade symtom, Kroppsliga symtom och Stress.

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REFERENCES


# Yrsele - Symtom

Var vänlig och markera det svarsalternativ som bäst motsvarar hur ofta Du upplevt varje symtom nedan under de senaste 12 månaderna eller sen Din yrsel började om Du haft yrsele mindre än ett år. Ringa in den siffran som motsvarar Din upplevelse.

**Svarsalternativen är:**

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<td>Aldrig</td>
<td>1-3 ggr på ett år</td>
<td>4-12 ggr på ett år</td>
<td>I medeltal mer än 1 gång/månad</td>
<td>I medeltal mer än 1 gång/vecka</td>
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Hur ofta **de senaste 12 månaderna** har Du haft följande symtom:

1. En känsla av att saker och ting snurrar eller rör sig, som varar:
   *(besvara alla kategorier)*
   
   a) mindre än 2 minuter
   
   b) upp till 1 timme
   
   c) mer än 1 timme
   
   d) hela dagen

2. Smärta i hjärt- och brösttrakten

3. Perioder av värme- eller köldkänslor

4. Så svår ostadighet att Du faktiskt har ramlat

5. Illamående, magen i uppror

6. Spänning eller ömhet i musklerna

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(Svensk översättning)
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7. En känsla av att vara vimmelkantig, svimfördig eller få svindel och som varar; (besvara alla kategorier)

a) mindre än 2 minuter  
   0 1 2 3 4
b) upp till 1 timme  
   0 1 2 3 4
c) mer än 1 timme  
   0 1 2 3 4
d) hela dagen  
   0 1 2 3 4

8. Skakningar, darrningar  
   0 1 2 3 4

9. Känsla av tryck i örat/öronen  
   0 1 2 3 4

10. Hjärtklappning eller bultande hjärta  
    0 1 2 3 4

11. Kräkningar  
    0 1 2 3 4

12. Känslor av tyngd i armar och ben  
    0 1 2 3 4

13. Synstörningar (t ex suddigt, filmigt, fläckar framför ögonen)  
    0 1 2 3 4

14. Huvudvärk eller en känsla av tryck i huvudet  
    0 1 2 3 4

15. Oförmåga att stå eller gå ordentligt utan stöd  
    0 1 2 3 4

16. Svårigheter att andas, andnöd  
    0 1 2 3 4

17. Tappa koncentrationen eller minnet  
    0 1 2 3 4

(Svensk översättning)
Svarsalternativen är:

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18. En känsla av ostadighet, håller på att tappa balansen, som varar; (besvara alla kategorier).
   a) mindre än 2 minuter
   b) upp till 1 timme
   c) mer än 1 timme
   d) hela dagen

19. Krypningar, stickningar eller förlamningar i delar av kroppen

20. Smärta i den nedre delen av ryggen

21. Svåra svettningar

22. En känsla av matthet, nära att svimma

23. En känsla av att Du eller omvärlden lutar (som på Lustiga Huset)

24. En känsla av att underlaget Du går på kännas avlägset/gungigt/som att gå på moln

25. Övrigt

   1. .................................................................
   2. .................................................................
   3. .................................................................
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   5. .................................................................

(Svensk översättning)
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   Doktorsavhandling/Doctoral thesis with focus on Nursing.

   Vetenskaplig uppsats för licentiatexamen/Academic essay.

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   Vetenskaplig uppsats för licentiatexamen/Academic essay.

   Doktorsavhandling/Doctoral thesis with focus on Occupational Therapy.

   Vetenskaplig uppsats för licentiatexamen/Academic essay.

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