Experiences With Spinal Cord Stimulator in Patients With Chronic Neuropathic Back Pain

Kine Gjesdal, RN, MSc, Bodil Furnes, RN, PhD, Elin Dysvik, RN, PhD

Pain Manag Nurs. 2014;15(3):e13-e24.

Abstract and Introduction

Abstract

Neuropathic pain is a complex, chronic, and disabling condition that has physical, functional, and psychosocial repercussions. Although the estimated prevalence of neuropathic pain in the general population ranges from 1.5% to 8%, neuropathic pain is frequently underdiagnosed and undertreated. The aims of this study were to examine the experience of patients treated with spinal cord stimulation as a pain-relieving treatment and how this may influence the patient's ability to participate in everyday life activities. A qualitative approach based on seven telephone interviews was performed. The participants were recruited from a university hospital in Norway, and all used spinal cord stimulation as a pain-relieving treatment. Qualitative content analysis was used. Two thematic findings emerged: (1) pain relief with spinal cord stimulation as a complex and individual experience and (2) challenges in adaptations in everyday life with spinal cord stimulation. Findings indicate that spinal cord stimulation can offer pain relief that can help patients achieve a meaningful life despite chronic pain. Spinal cord stimulation also may have disadvantages that should be considered before offering this treatment. It seems evident that extended information needs about working mechanism of SCS and precautions as well as follow-up are required to meet unexpected challenges in adaptation. Here the nurse has an important role when informing and following this patient group.

Introduction

Neuropathic pain is a complex, chronic, and disabling condition that has physical, functional, and psychosocial repercussions (Henwood, Ellis, Logan, Dubouloz, & D'Eon 2010). Although the estimated prevalence of neuropathic pain in the general population ranges from 1.5% to 8%, neuropathic pain is frequently underdiagnosed and undertreated (Davis, 2000, Kumar et al., 2007a). Neuropathic pain is defined by the International Association for the Study of Pain (IASP, 2012 p. 2) as "Pain arising as a direct consequence of a lesion or disease affecting the somatosensory system." The chronic, unrelenting nature of neuropathic pain means that many patients experience depression, sleep disturbances, and interference with functional capacity and social participation (Moir, 2009).

Neuropathic pain is managed in a number of ways, but conventional and pharmacological treatments are rarely successful in eliminating pain (Finnerup, Otto, McQuay, Jensen, & Sindrup 2005). Conventional treatments provided by large multidisciplinary teams include pharmacological approaches, pain management programs, physiotherapy, alternative therapies, and psychological support (Moir, 2009). Chronic pain that is not treated effectively and relieved may have a harmful effect on all aspects of health-related quality of life (HRQoL) (Dysvik, Lindstrøm, & Eikeland 2004). According to Turk (2003), even the most potent medications reduce chronic pain by only 30%-40%. Therefore, more effective treatments for chronic pain are needed. Advanced pain therapy such as spinal cord stimulation (SCS) is one such treatment. Appropriate selection of patients for SCS should include assessment of physical, psychological, and social functioning (Atkinson et al. 2011). Although SCS is considered more invasive, expensive, and risky than other more conventional treatments (Mekhail, Aeschback, & Stanton-Hicks 2004), studies show that SCS can reduce pain by an average of 65% in carefully selected patients (Turk, 2003).

Spinal cord stimulation has been used to treat neuropathic pain since the early 1970s (Taylor, Van-Buyten, & Bucher 2004), and more than 14,000 SCS implantations are now performed worldwide each year (Atkinson et al., 2011). The technique alleviates pain through electrical impulses sent to the spinal cord. It is thought that the impulses work to inhibit pain circuits within the dorsal horn of the spinal cord, although the exact mechanism by which this technique works is unclear (Kumar et al., 2007b). SCS induces a sensation in the area of pain, which patients describe as "tingling" and which masks the area of pain and provides comfort instead of the usual pain. The ultimate goals of SCS are to reduce pain, improve quality of life and functional capacity, reduce pain medication, and help patients return to a productive lifestyle (Moir, 2009).

Several studies of pain indicate that there are sociodemographic and gender differences in patients with chronic pain (Dysvik et al., 2004). Chronic pain appears to affect men and women differently (Vallerand & Polomano, 2000); i.e., women are at a greater risk (Fillingim, King, Ribeiro-Dasila, Rahim-Williams, & Riley 2009). Biopsychosocial mechanisms may underlie the gender differences in chronic pain, and a biopsychosocial approach should be seen as an appropriate way of understanding the considerable variation in patients' responses to the same treatment. Specifically, the biopsychosocial model emphasizes a holistic understanding of illness (Engel, 1977) and that pain is best viewed as the product of the complex interaction of physical, cognitive, emotional, behavioral, and social factors (Turk, 2003). The experience of chronic pain also places the painful body in focus, changing the way the patient relates to the world (Merleau-Ponty, 2012). This means that patients with chronic pain experience both the physical aspects of pain and discomfort and a loss of identity by which one feels alienated and detached from things that used to give life meaning (Bullington, 2009).

Most people with chronic pain continue to experience at least some pain regardless of the treatment they receive (Turk, 2003), and many people therefore face the task of adapting to a chronic pain condition (Roy & Andrews, 1999). According to the Roy Adaptation Model (Roy & Andrews, 1999), adaptation occurs within four adaptive modes: physiological, self-concept, interdependence, and role-function. Active approach-oriented coping strategies help in the management of disease-related challenges and may bolster adaptation, whereas concerted efforts to avoid disease-related thoughts and feelings are predictors of distress (Stanton, Revenson & Tennen, 2007). Lazarus (1966) and Lazarus and Folkman (1984) also link stress-related variables to health-related outcomes and view the concept of health broadly to encompass physical, psychological, and social aspects.

Acceptance of pain could also be a critical issue in adaptation and can be viewed as an alternative to the deconditioning and increased disability that result from efforts to avoid painful activities (Henwood et al., 2010). In addition, acceptance of pain is seen as a therapeutic process that can reduce catastrophic thinking and pain-related fear and avoidance (McCracken & Keogh, 2009). Beliefs about pain also appear to be important for understanding the response to treatment, adherence to self-treatment activities, and disability (Turk, 2003). Pain beliefs represent "patient's own conceptualization of what pain is and what pain means to them" (Williams & Thorn, 1989, p. 351). People suffering from chronic pain often mistakenly view hurt as synonymous with harm. A shift from beliefs about helplessness and passivity to resourcefulness and ability to function, regardless of pain, seems to be essential (Turk, 2003). Behavioral and self-reported data also suggest that the patient's beliefs and expectations can shape both therapeutic and adverse effects (Novella, 2011). It has long been recognized that there are substantial multifactorial placebo effects that create real and illusory improvements in response to even an inactive treatment (Novella, 2011). A recent study sheds light on the expectation placebo effect for pain. Bingel et al. (2011) proposed that it might be necessary to integrate the patient's beliefs and expectations to optimize treatment outcomes. Most previous studies have not included a qualitative approach. As such, a qualitative study is suggested, which allows insight into the patients' experiences with SCS and essential knowledge when treating and caring for these patients. Based on this background, the aim of this study was twofold: (1) to examine the personal experiences of patients with SCS as a pain-relieving treatment and (2) to study how experiences with SCS may influence the patient's ability to participate in everyday life activities.

Methods

Design

A qualitative design using semi-structured interviews by phone was used. The present qualitative study includes a descriptive and exploratory design and a phenomenological approach (Kvale & Brinkmann, 2009). Thus, our approach was open to the experiences of SCS in everyday life.

Sample Selection

All the informants were recruited through a neurosurgery unit in a Norwegian university hospital. This hospital offers SCS to patients across the country. The study was planned in collaboration with the department manager at the unit, who initiated all contact with the participants. The department manager recruited participants through purposive sampling, which involved choosing 7 specific patients from a list of outpatients who had an implanted spinal cord stimulator according to the inclusion criteria. Purposive sampling means that the researcher's knowledge of the population and its elements is used to handpick cases typical of the population to be included in the sample (Whitehead & Annells, 2007).

To be enrolled in the study, the participants had to fulfill the following inclusion criteria: chronic neuropathic back pain, nonmalignant pain, implanted spinal cord stimulator, use of the stimulator frequently for at least 6 months, age 30–65 years, and ability to write and speak Norwegian fluently (this information was taken from the patient's journal).

The average age of the patients was 48 years (range 38 to 64 years). Four men and three women participated; four were employed. They had lived with the same brand of SCS for an average of 2 years (range 6 months to 4 years).

Ethical Considerations

Ethical approval was obtained from the Regional Committee of Medical and Health-related Research Ethics, Norway (approval number 2011/1889). Every participant received by mail written information about the study, including information about their right to withdraw from the study at any point in time without any negative consequences. After written informed consent was obtained from each participant, the informant's identity was revealed to the researcher. The participants were then contacted to schedule the interviews.

Data Collection and Analysis

The data were collected by telephone, using a semi-structured interview guide. For documentation and later analysis, the interviews were recorded using a digital voice recorder. The interviews lasted from 20 to 40 minutes, and the topics included pain management, functionality, and everyday life to capture treatment experiences. All interviews were conducted, recorded, and transcribed by the first author within 1 day after the interview (Appendix A). The transcribed interviews were analyzed using a method inspired by Graneheim and Lundman's (2004) qualitative content analysis. The analytical process occurred in six stages (see for details).

Table 1. Stages of the Analytic Process

1	Open reading	Reading each script several times to gain an impression of what was being said.
2	Identifying meaning units	Patterns in the data were identified by dividing the text into meaning units.
3	Condensed meaning units	The researcher condensed meaning units into more formalized and written style.
4	Creating codes	Creating codes, making it possible for the researcher and co-authors to see the data in a new way.
5	Sorting into categories	All codes were compared, based on differences and similarities, and sorted into categories. Tentative codes and categories were discussed and revised by the researcher and the co-authors.
6	Formulating into themes	The latent content of the categories was formulated into a theme.

Results

The results of the qualitative content analysis revealed two thematic findings: "pain relief with SCS is a complex and an individual experience" and "challenges in adaptation to SCS in everyday life" (and). The main findings that emerged after conducting the analysis are described below. Quotations are given in italics to clarify the findings and give the participants a voice.

Table 2. Experiences of Pain Relief with SCS: Examples of Qualitative Content Analyses Indicating the Abstraction Process from

Condensed Meaning Units to Theme

Condensed Meaning Unit	Code	Category	Theme
The very best thing is not having to deal with the side effects of medications.	Avoid side effects from medications	Positive experiences of pain relief compared to medication	Pain relief with spinal cord stimulation is a complex and an individual experience
I do feel a little pain, but now I don't feel drugged, and I have a more normal life.	A more normal life		
It is just unbelievable having such a function instead of being drugged by medication.	Pain relief without medication		
The help that I have from the stimulator allows me to deal with the pain in a different way—to better cope with it.	Improved pain management		
Sometimes I turn it off, but then I turn it on again soon; I can't go a long time without it before I become ill.	Testing indicates good pain relief		
Before I got the stimulator I had to take pills, and I woke up several times during the night in pain, but that does not happen now. Or it may happen, but then I put the stimulator on, and it works just fine.	Pain relief without medication		
I had had a foreign element implanted - what was I? A robot?	AlienationUncertainty	Negative experiences related to side- effects	
It is very nice, but I don't feel like it works well enough.	Limited pain relief		
I had hoped that it would help even more than it does, I really had.	Disappointment		
You know that it's electric, and I still receive shocks depending on the way I move.	Side effect, Receiving shock		
It's electricity, and you receive shocks that goes into your back, and depending on how much electricity you have on, they may also go down through your legs.	Side effect, Receiving shock		
When I use the stimulator, I feel the stimulation in the esophagus, and after a while I feel like I have to throw up.	Side effect, Feels like throwing up		
I have had the cable replaced and the battery moved a few times; I think I have been operated on a total of 13 times.	Several complications, technical failure		

I wore a battery that jumped off the mount as soon as I put it on, standing out at a 90 degree angle, so I have not been able to wear pants with a waistband.	Complications, Technical failure		

Table 3. Experiences of Challenges with SCS in Adaptation in Everyday Life: Examples of Qualitative Content Analyses Indicating the Abstraction Process from Condensed Meaning Units to Theme

Condensed Meaning Unit	Code	Category	Theme
I may experience pain relief for 3 or 4 hours, and then it goes without saying, that you have a stronger desire to do stuff.	Greater involvement	Positive impact on functioning and involvement	Challenges in adaptation to SCS in everyday life
Pain brings limitations, and when the pain disappears, you have the opportunity to participate more in everyday life.	Sees opportunities		
I had so much pain that I had difficulties showing an interest in talking to others, but now I can control it better, so I can function much more normally.	Improved social functioning		
I may go for a drive, and sit down and have a drink afterwards without taking pills, so now I really live.	Joy of life		
I have not gone skiing or skating in ages, but now I know that this is something that I cannot do.	Limitations	Negative impact and restrictions	
It triggers EAS (Electronic Article Surveillance) alarms, and it's no fun being seen as a shoplifter. I dread going to such places.	Worries		
I can never plan anything; things change day to day, and it does not always work so well (the stimulation).	Unpredictability		
Passing through an EAS (Electronic Article Surveillance) system so that it changes the settings, making me unable to control the stimulator again—that it is my great fear.	Worries		

Pain Relief With SCS is a Complex and an Individual Experience

The empirical material indicated that the patients had differing experiences concerning SCS.

The most common positive experience that emerged was the possibility of avoiding the side effects of medication:

> "The very best thing is not having to deal with the side effects of medications."
>
> "I do feel a little pain, but now I don't feel drugged, and I have a more normal life."

Many of the respondents had stopped taking pain-relieving medication after they received nerve stimulation:

> "It is just unbelievable having such a function instead of being drugged by medication."
>
> "Before I got the stimulator, I had to take pills, and I woke up several times during the night in pain, but that does not happen

> now. Or it may happen, but then I put the stimulator on, and it works just fine."

Improved pain relief was another important finding. One participant said:

> "Sometimes I turn it off, but then I turn it on again soon; I can't go a long time without it before I become ill."

When pain relief is experienced, it may also result in better pain management:

> "The help that I have from the stimulator allows me to deal with the pain in a different way—to better cope with it."

However, the perception of pain and pain-relieving treatment is a complex phenomenon, and several patients also expressed some negative experiences. Many experienced side effects in relation to use of the technical device:

> "You know that it's electric, and I still receive shocks depending on the way I move."

> "It's electricity, and you receive shocks that go into your back, and depending on how much electricity you have on, they may also go down through your legs."

Some had also experienced incorrect stimulation because of misplacement of the electrodes:

> "When I use the stimulator, I feel the stimulation in the esophagus, and after a while I feel like I have to throw up."

Other negative experiences involved complications related to the technical equipment itself:

> "I have had the cable replaced and the battery moved a few times. I think I have been operated on a total of 13 times."

> "I wore a battery that jumped off the mount as soon as I put it on, standing out at a 90 degree angle, so I have not been able to wear pants with a waistband."

Several of the respondents also reported disappointment because of limited pain relief and unmet expectations:

> "It is very nice, but I don't feel it works well enough."

> "I had hoped that it would help even more than it does, I really had."

Some also found it odd to have a foreign object in their body:

> "I had a foreign element implanted—what was I? A robot?"

Challenges in Adaptation to SCS in Everyday Life

The findings indicate that nerve stimulation may have various effects on the patient's adaptations to everyday life. Informants reported that life after receiving pain relief by nerve stimulation was characterized by more opportunities and an increased desire for active participation:

> "Pain brings limitations, and when the pain disappears, you have the opportunity to participate more in everyday life."

> "I may experience pain relief for 3 or 4 hours, and then it goes without saying, that you have a stronger desire to do stuff."

Some of the participants also said that their social function and joy in life were improved because of increased participation in everyday activities:

> "I had so much pain that I had difficulty showing an interest in talking to others, but now I can control it better, so I can function much more normally."

> "I may go for a drive, and sit down and have a drink afterward without taking pills, so now I really live."

However, the respondents also learned how nerve stimulation could hamper their participation in everyday life. They talked about several limitations, uncertainties, and concerns related to the use of nerve stimulation. Physical limitations with SCS were noted:

> "I have not gone skiing or skating in ages, but now I know that this is something that I cannot do."

Some also experienced unpredictability related to the nerve stimulator's varying effects:

> "I can never plan anything, things change from day to day, and it does not always work so well."

Rejection of activities and worries were also experienced:

> "It [the stimulator] triggers EAS [electronic article surveillance] alarms, and it's no fun to be seen as a shoplifter. I dread going to such places."

> "Passing through an EAS system so that it changes the settings, making me unable to control the stimulator again—that is my great fear."

Discussion

The aim of the study was twofold: (1) to examine the personal experiences of patients with SCS as a pain-relieving treatment and (2) to study how experiences with SCS may influence the patient's ability to participate in everyday life activities. The discussion follows the same sequence as the Results section.

Pain Relief With SCS is a Complex and an Individual Experience

This study identified different patient experiences with nerve stimulation as pain-relieving treatment. Several of the participants experienced a positive pain-relieving effect from the SCS. Most patients reported reduction in their drug regime, and some were able to quit all their analgesic medication. Several said that the best aspects of SCS were a reduced need for pain medication and, thereby, the ability to avoid side effects. These findings are consistent with the findings of North, Kidd, Shipley, and Taylor (2007). The administration of opiates to treat chronic pain creates the risk of misuse, which has increasingly become a challenge for pain centers (Goucke, 2003). Although pain relief was achieved, some of the informants in our study experienced difficulties in discontinuing prior medication because of addiction problems.

Several of the participants continued to experience pain despite use of SCS. According to Turk (2003), most people with chronic pain continue to experience at least some pain regardless of the treatment they receive. Although all patients received information about the treatment goal of SCS, which was to reduce pain by more than 50%, several expressed disappointment. Some of the patients had expectations of being more or less pain free after receiving the implant and were, therefore, disappointed that this did not happen. This could mean that some of the patients may have had an unrealistic understanding of the effects of SCS and were expecting a "cure" instead of a method for coping and living with less pain. Bingel et al. (2011) highlighted the importance of integrating the patient's expectations and beliefs to optimize treatment outcomes and to consider the placebo effect.

Only one of the participants in this study was offered a pain management program in addition to SCS. This informant noted that acceptance of a life of chronic pain was essential. This participant was no longer looking for a way of obtaining relief from the pain but was searching for a way to have a meaningful life despite the pain. It is believed that acceptance and learning to live with pain are beneficial in reducing suffering and facilitating a more satisfying and fulfilling life in people with chronic pain (Henwood et al., 2010). The importance of acceptance when dealing with chronic pain was also found in prior research (Henwood et al., 2010, McCracken and Keogh, 2009, Wright et al., 2011). Believing that pain represents damage, may lead to more anxiety among our participants, which might also reduce the pain-relieving effect of any treatment. A patient's fear of pain, interpretation of what the pain means, and concerns about how it will affect his or her life are important targets for therapy (Goucke, 2003). Various reports have described significant associations between pain beliefs and functionality in people with chronic pain (Dysvik et al., 2004, Juuso et al., 2011, Nieto et al., 2012). The meaning of pain is an important issue; according to Turk and Okifuji (2002), it is typical for patients with chronic pain to misunderstand the meaning of the pain.

Some of the patients in our study became scared when they received shocks even with small movements, and others experienced alienation because of the implanted device. This can make the patient unsure and worried, which could impair the effects of SCS. According to Merleau-Ponty (2012), human perception is "embodied," and when the body does not behave as expected, the familiar way of pursuing daily life needs to be regained. The familiar way of being in the world can be reestablished if the patient can get used to, and no longer feel unfamiliar with, the changes in the conditions of their everyday life (Bullington, 2009).

All participants in the present study reported some negative effects of the spinal cord stimulator. The most common complications were related to receiving shocks caused by small movements, a misplaced battery or wire, or infection related to revision of the stimulator. The complications and risks associated with SCS reported in the literature vary considerably because of differences between studies in the length of follow-up, publication date, and age of the implanted technology (Kumar et al., 2007a). The most common complications are stimulator revision, stimulator removal, and equipment failure (Turner, Loeser, Deyo & Sanders 2004). Despite technological advances and growing expertise in the past decade, our study demonstrates that patients continue to experience various disadvantages and complications.

Challenges in Adaptation to SCS in Everyday Life

The most striking issue in relation to adaptation to everyday life described in this study was that the participants experienced an increased interest in their social life and a greater desire to participate in a wider range of activities. Maes, Leventhal, and DeRidder (1996) posited that although anxiety and depression are important markers of adjustment, assessment of everyday life behavior and activities might be more relevant. Several informants in our study described an increased joy in life and were able to see more opportunities. Pain is typically associated with lower HRQoL and high levels of functional disability (Jensen et al., 2007, McDermott et al., 2006). Patients with neuropathic pain have an HRQoL considerably lower than the general population (Kosinski et al., 2005, Meyer-Rosberg et al., 2001). The findings in the present study showing improved social functionality and greater involvement might be related to the pain-relieving effect of the SCS, which allowed some of the participants to be more or less pain free for a period of hours.

According to Merleau-Ponty (2012), we can use instruments to extend our life-world. Integrating SCS as a part of the body means that the instrument stops being a "thing" and instead provides a way to extend the life-world. For some of the informants in this study, the nerve stimulator may represent this kind of instrument. Our findings also suggest that experiences related to SCS as a pain relieving method may contribute to improved functioning in everyday life. These findings are consistent with prior research showing improved HRQoL in patients who used SCS (Kumar et al., 2007b, Manca et al., 2008). We emphasize, however, that even though SCS may contribute to and mediate adaptation and improved functioning, it probably also interacts with other factors in contributing to adaptation in everyday life.

Several informants experienced unpredictability and worries related to SCS. These limitations were associated with varying effects of the stimulator, which made the informants insecure and afraid of planning in advance. Unpredictability according to the varying pain intensity is a well-documented cause of anxiety and depression (Davis, 2000). Similar findings have been reported in previous studies, in which about 40% of patients experienced ongoing marked disability and HRQoL problems despite significant improvements gained through SCS (Eldabe, Kumar, Buchser, & Taylor 2009). This demonstrates that treating chronic pain is complex (Davis, 2000). Chronic pain sufferers might benefit from a biopsychosocial approach that takes into account biological, psychological, and sociocultural variables (Turk & Okifuji, 2002). Therefore, it is not surprising that neither drug treatment nor SCS alone is very effective unless it is administered as part of an overall management plan (Goucke, 2003). Several studies have noted that cognitive behavioral therapy can give additional help to patients to live a meaningful life despite the pain (Aggarwal et al., 2010, Guzmán et al., 2006), as indicated by one of our participants. Another limitation the informants experienced was that the device triggered electronic article surveillance (EAS) in shops, causing them to dread visits such places. They also feared the EAS in airports because the settings in the stimulator could change or cause the battery to run out of power. These experiences affect the patient's ability to adapt to everyday life with SCS and should be mentioned when offering SCS to patients.

Clinical Implications

A biopsychosocial approach is suggested as pain relief is multifacilitated and complex. Our findings indicate that the information about SCS given to patients before treatment should be supplemented and tailored each individual. Important details to be included in the adaptation process are the nature of pain, patient beliefs, realistic treatment goals and acceptance. In addition, working mechanism of SCS and precautions due to the technical equipment should be highlighted. To succeed, nurses should maintain a good dialogue, focusing on patients' information needs and individual follow-up.

Further Research

We suggest that future research should focus on the monitoring of these patients by nurses and whether the patient's expectations and beliefs before and during therapy are important for optimizing the effects of SCS. We also suggest that research is needed on the long-term experiences of SCS, especially those related to nurses' follow-up routines. It would also be beneficial to investigate further the sex differences to optimize the effects of SCS.

Methodological Considerations

Qualitative research findings should be as trustworthy as possible, which refers to the degree of confidence qualitative researches have in their data. Strategies used to ensure the trustworthiness of the data analysis in this study include a detailed description of the analytical steps by a thorough presentation and interpretation of quotations, which contributes to the transparency and credibility of the findings. Our research findings are based on individual analysis and, thereafter, discussions to reach consensus. The participants were contacted later to confirm that the findings covered the intended meaning. The examples of findings in this study are presented so that the reader has the opportunity to look for alternative interpretations. Credibility was secured by choosing participants across the country with various genders and range of experiences to explore the research questions from a variety of angles. The study has a rather small sample size and purposive selection of subjects. However, the descriptions in the study are extensive and detailed, covering important aspects of the phenomenon studied. Moreover, the findings in this study are consistent with those produced by prior research (Eldabe et al., 2009, Kumar et al., 2007b, Manca et al., 2008). Our findings may be transferable to other professionals or people in similar situations by considering the patient's culture and context, as well as methods of data collection and analysis.

The interviews were conducted by telephone. One of the advantages of telephone interviewing is the extended access to participants compared with face-to-face interviews (Mann & Stewart, 2000). This allowed us to include informants across the country. Another advantage of telephone interviews is related to the sensitivity of the details discussed, and the distance may have resulted in a less threatening situation (Mann & Stewart, 2000). However, telephone interviewing has disadvantages too, such as fewer social cues (Mann & Stewart, 2000). We could not see the informant, so body language was not available as a source of extra information. Social cues such as voice and intonation were still available and were emphasized in the transcription of the data. Another disadvantage of telephone interviews is the less time spent on social preliminaries, which may have led to a sense of a more formal and less social encounter (Mann & Stewart, 2000). This may have led to more superficial descriptions.

Conclusion

This study indicates that patients receiving SCS experienced increased pain relief and reduced consumption of drugs. However, the informants also emphasized negative experiences of SCS, for example that the effects did not meet their expectations. The result also emphasized that SCS can have a positive impact on patients' of ability to participate in everyday life activities, although several of the patients also experienced disadvantages, such as electronic device malfunction or receiving shocks. These findings indicate that SCS can offer pain relief that can help patients achieve a meaningful life despite chronic pain. It seems evident that extended information needs about working mechanism of SCS and precautions as well as follow-up are required to meet unexpected challenges in adaptation.

Appendix A

Interview Guide

Opening questions:

1. Male or female?
2. For how long have you had the spinal cord stimulator implemented?

Theme 1: Nerve Stimulation as Pain Relieving Treatment

How did you experience the implementation of the stimulator?

How is your experience with nerve stimulation as pain relieving treatment?

In what way would you describe your satisfaction with this treatment?

How has the nerve stimulation affected your consumption of analgesic drugs?

Theme 2: Level of Functioning

In what way has nerve stimulation had an impact on your level of functioning in relation to:

Participation in family life

Physical activity

Your responsibilities at home

Participation in working life

Theme 3: Everyday Life

In what way have nerve stimulation affected your life?

How do you cope with everyday life now, compared to previously?

How is your ability to participate in social life been affected by nerve stimulation?

Is there something you wished you were informed of before you decided to have the stimulator implemented?

References

1. Atkinson, L., Sundaraj, S. R., Brokker, C., O'Callaghan, J. O., Teddy, P., Salmon, J., & Majedi, P. M. (2011). Recommendations for patient selection in spinal cord stimulation. *Journal of Clinical Neuroscience, 18*(10), 1295–1302.
2. Aggarwal, V. R., Tickle, M., Javidi, H., & Peters, S. (2010). Reviewing the evidence: Can cognitive behavioral therapy improve outcomes for patients with chronic orofacial pain? *Journal of Orofacial Pain, 24*(2), 163–171.
3. Bingel, U., Wanigasekera, V., Wiech, K., Mhuircheartaigh, R. N., Lee, M. C., Ploner, M., & Tracey, I. (2011). The effect of treatment expectation on drug efficacy: Imaging the analgesic benefit of the opioid remifentanil. *Science Translational Medicine, 3*(70), 70ra14.

4. Bullington, J. (2009). Embodiment and chronic pain: Implications for rehabilitation practice. *Health Care Analysis, 7*(2), 100–109.
5. Davis, B. D. (2000). *Caring for people in pain*. London: Routledge.
6. Dysvik, E., Lindstrøm, T. C., & Eikeland, O. J. (2004). Health-related quality of life and pain beliefs among people suffering from chronic pain. *Pain Management Nursing, 5*(2), 66–74.
7. Eldabe, S., Kumar, K., Buchser, E., & Taylor, R. (2009). An analysis of the components of pain, function, and healthrelated quality of life in patients with failed back surgery syndrome treated with spinal cord stimulation or conventional medical management. *Neuromodulation; Technology at the Neural Interface, 10*(13), 201–209.
8. Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196*(4286), 129–136.
9. Fillingim, R. B., King, C. D., Ribeiro-Dasila, M. C., Rahim-Williams, B., & Riley, J. L. (2009). Sex, gender, and pain: A review of recent clinical and experimental findings. *The Journal of Pain, 10*(5), 447–485.
10. Finnerup, N. B., Otto, M., McQuay, H. J., Jensen, T. S., & Sindrup, S. H. (2005). Algorithm for neuropathic pain treatment: An evidence based proposal. *Pain, 118*(3), 289–305.
11. Goucke, R. C. (2003). The management of persistent pain. *Medical Journal of Australia, 178*, 444–447.
12. Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today, 24*, 105–112.
13. Guzm_an, J., Esmail, R., Karjalainen, K., Malmivaara, A., Irvin, E., & Bombardier, C. (2006). Multidisciplinary biopsycho-social rehabilitation for chronic low back pain. *Cochrane Database Systematic Review, 2*, CD000963.
14. Henwood, P., Ellis, J., Logan, J., Dubouloz, C., & D'Eon, J. (2010). Acceptance of chronic neuropathic pain in spinal cord injured persons: A qualitative approach. *Pain Management Nursing, 32*(2), 114–124.
15. IASP (2012). "Pain definitions." Retrieved October, 30, 2012, from http://www.iasp-pain.org/AM/Template.cfm?Section=Home&Template=/CM/ContentDisplay.cfm&ContentID=6633
16. Jensen, M. P., Chodroff, J. M., & Dworkin, R. H. (2007). The impact of neuropathic pain on health related quality of life: Review and implications. *Neurology, 68*, 1178–1182.
17. Juuso, P., Skär, L., Olsson, M., & Söderberg, S. (2011). Living with a double burden: Meanings of pain for women with fibromyalgia. *International Journal of Qualitative Studies on Health and Well-being, 6*(3), 1–9.
18. Kosinski, M. R., Schein, J. R., Vallow, S. M., Ascher, S., Harte, C., Shikiar, R., Frank, L., Margolis, M. K., & Vorsanger, G. (2005). An observational study of health related quality of life and pain outcomes in chronic low back pain patients treated with fentanyl transdermal system. *Current Medical Research and Opinion, 21*(6), 849–862.
19. Kumar, K., Buchser, E., Linderoth, B., Meglio, M., & Van Buyten, J. P. (2007a). Avoiding complications from spinal cord stimulation: Practical recommendations from an international panel of experts. *Neuromodulation; Technology at the Neural Interface, 10*(1), 10.
20. Kumar, K., Taylor, R. S., Jacques, L., Eldabe, S., Meglio, M., Molet, J., Thomson, S., O'Callaghan, J., Eisenberg, E., Milbouw, G., Buchser, E., Fortini, G., Richardson, J., & North, R. B. (2007b). Spinal cord stimulation versus conventional medical management for neuropathic pain: A multicentre randomized controlled trial in patients with failed back surgery

syndrome. *Pain, 132*, 179–188.

21. Kvale, S., & Brinkmann, S. (2009). *Interviews—Learning the craft of qualitative research interviewing*. Los Angeles: SAGE.
22. Lazarus, R. S. (1966). *Psychological stress and the coping process* (pp. 365–390). New York: McGraw-Hill.
23. Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping* (pp. 181–223). New York: Springer Publisher Company.
24. Maes, S., Leventhal, H., & DeRidder, D. T. (1996). Coping with chronic diseases. In M. Zeidner, & N. S. Endler (Eds.), *Handbook of coping: Theory, research, applications (221–251)*. New York: John Wiley & Sons.
25. Manca, A., Kumar, K., Taylor, R. S., Jacques, L., Eldabe, S., Meglio, M., Molet, J., Thomson, S., O'Callaghan, J., Eisenberg, E., Milbouw, G., Buchser, E., Fortini, G., Richardson, J., Taylor, R. J., Goeree, R., & Sculpher, M. J. (2008). Quality of life, resource consumption and costs of spinal cord stimulation versus conventional medical management in neuropathic pain patients with failed back surgery syndrome (PROCESS trial). *European Journal of Pain, 12*(8), 1047–1058.
26. Mann, C., & Stewart, F. (2000). *Internet communication and qualitative research*. London: Sage.
27. McCracken, L. M., & Keogh, E. (2009). Acceptance, mindfulness, and values-based action may counteract fear and avoidance of emotions in chronic pain: An analysis of anxiety sensitivity. *The Journal of Pain, 10*(4), 408–415.
28. McDermott, A. M., Toelle, T. R., Rowbotham, D. J., Schaefer, C. P., & Dukes, E. M. (2006). The burden of neuropathic pain: Results from a cross-sectional survey. *European Journal of Pain, 10*(2), 127–135.
29. Mekhail, N., Aeschback, A., & Stanton-Hicks, M. (2004). Costs benefit analysis of neurostimulation for chronic pain. *Clinical Journal of Pain, 20*(6), 462–468.
30. Merleau-Ponty, M. (2012). *Phenomenology of perception*. London: Routlegde & Keagan Paul.
31. Meyer-Rosberg, K., Burckhardt, C. S., Huizar, K., Kvarnstrøm, A., Nordfors, L. O., & Kristofferson, A. (2001). A comparison of the SF-36 and Nottingham Health profile in patients with chronic neuropathic pain. *European Journal of Pain, 5*(4), 391–403.
32. Moir, L. (2009). Managing chronic neuropathic pain: The role of spinal cord stimulation. *British Journal of Community Nursing, 14*(5), 207–209.
33. Nieto, R., Raichle, K. A., Jensen, M. P., & Mirò, J. (2012). Changes in pain-related beliefs, coping, and catastrophizing predict changes in pain intensity, pain interference, and psychological functioning in individuals with myotonic muscular dystrophy and facioscapulohumeral dystrophy. *Clinical Journal of Pain, 28*(1), 47–54.
34. North, R. B., Kidd, D. H., Shipley, J., & Taylor, R. S. (2007). Spinal cord stimulation versus reoperation for failed back surgery syndrome: A cost effectiveness and cost utility analysis based on a randomized controlled trial. *Neurosurgery, 61*(2), 361–369.
35. Novella, S. (2011). Placebo effect for pain. Retrieved from August, 28, 2012, from http://www.sciencebasedmedicine.orgh/index.php/placebo-effect-for-pain.
36. Roy, S. C., & Andrews, H. (1999). *The Roy Adaptation Model*, (2th ed.) Stamford: Appleton & Lange.
37. Whitehead, D., & Annells, M. (2007). Sampling data and data collection in qualitative research. In Z. Schneider, D. Whitehead, & D. Elliott (Eds.), *Nursing and midwifery research. Methods and appraisal for evidence-based practice* (pp.

122–136). London: Mosby.

38. Stanton, A. L., Revenson, T. A., & Tennen, H. (2007). Health psychology: Psychological adjustment to chronic disease. *Annual Review of Psychology, 58*, 565–592.
39. Taylor, R. S., Van-Buyten, J. P., & Bucher, E. (2004). Spinal cord stimulation for chronic back and leg pain and failed back surgery syndrome: A systematic review and analysis of prognostic factors. *Spine, 30*(1), 152–160.
40. Turk, D. C. (2003). Cognitive-behavioral approach to the treatment of chronic pain patients. *Regional Anesthesia and Pain Medicine, 28*(6), 573–579.
41. Turk, D. C., & Okifuji, A. (2002). Psychological factors in chronic pain: Evolution and revolution. *Journal of Consulting and Clinical Psychology, 70*(3), 678–690.
42. Turner, J., Loeser, J., Deyo, R., & Sanders, S. (2004). Spinal cord stimulation for patients with failed back surgery syndrome or complex regional pain syndrome: A systematic review of effectiveness and complications. *Pain, 108*(1–2), 37–147.
43. Vallerand, A. H., & Polomano, R. C. (2000). The relationship of gender to pain. *Pain Management Nursing, 1*(3), 8–15.
44. William, D. A., & Thorn, B. E. (1989). "An empirical assessment of pain beliefs. *Pain, 36*(3), 351–358.
45. Wright, M. A., Wren, A. A., Somers, T. J., Goetz, M. C., Fras, A. M., Huh, B. K., Rogers, L. L., & Keefe, F. J. (2011). Pain acceptance, hope, and optimism: Relationships to pain and adjustment in patients with chronic musculoskeletal pain. *The Journal of Pain, 12*(11), 1155–1162.

Acknowledgments

We thank the informants who volunteered to participate in the study, and the neurosurgery unit for outstanding collaboration.

Pain Manag Nurs. 2014;15(3):e13-e24. © 2014 Elsevier Science, Inc.