

**SPECIAL PAPER****Rehabilitation Nursing: Applications for Rehabilitation Nursing****Ayşegül Koç, PhD, RN**

Assistant Professor, School of Health, Bozok University, Yozgat, Turkey

**Correspondence:** Ayşegül Koç, PhD, RN, Assistant Professor Bozok University School of Health

66100, Yozgat, Turkey, Tel: +90 354 212 1190, Fax: +90 354 212 2653

E-mail: [aysegulkocmeister@gmail.com](mailto:aysegulkocmeister@gmail.com)**Abstract**

Rehabilitation nursing is a specialist form of rehabilitation requiring specialist nursing. Furthermore, as in many areas of nursing, nurses in this field recognize that there is a need to increase the quality of and provide the most up-to-date care for their patients and patients' families. To achieve high levels of competence, neurological rehabilitation nurses need to be aware of the existing body of research in this field. Effective hospital and community rehabilitation services are increasingly recognised as a means of meeting the changing pattern of health and social care requirements. This review aims to validate the existing knowledge base in this area by identifying and critically analysing research conducted in the area of neurological rehabilitation nursing.

**Keywords:** rehabilitation; rehabilitation nurses; neurology; rehabilitation management; neurological disorders; head injury; nurse

**Introduction**

The number of people requiring rehabilitation is increasing (Teasell R. 2003 and Ed: 2006). Nurses today will care for more patients with chronic neurological problems, more patients with head injury, and more elderly people in need of care, and because these patients often have a wide range of physical, cognitive and behavioural problems, the rehabilitation needs of these patients are diverse and complex (Green 1997, Green 2002). As rehabilitation nursing requires autonomous professional knowledge, it is increasingly gaining momentum (Teasell R. 2003). However, like many areas of nursing, nurses in this field recognize that there is a need to strengthen their knowledge in order to ensure that they provide the best possible care for patients and their families. Rehabilitation nurses can start by reviewing their application fields and competencies in order to upgrade their professional skills.

**Principles of rehabilitation:**

1. The prevention, diagnosis and treatment of concomitant medical problems (co-morbid illnesses, complications)
2. Training for maximum functional independence,

3. To support psychosocial coping and assist in the adaptation of patients and families,
4. To support the return to community life
5. To improve the quality of life of patient and family members who provide care

**Rehabilitation Nursing**

Nurses are qualified health care professionals that provide nursing services to help patients to develop problem-solving and stress management skills and to improve patients' quality of life by following the physiological and psychological changes of the patients.

A rehabilitation nurse is specialized in the care of dependent or semi-dependent individuals, and provides direct patient care, educates patients and their families, and provides care coordination. A rehabilitation nurse should first start with what the patients and their families want to know and what they need, and should be a good trainer and love their work.

A rehabilitation nurse creates a creative and dynamic process which supports the individual's "functional capacity", namely the dynamic interaction with the environment, and plays a role in helping patients achieve their maximum functional capacity. Thus, a

rehabilitation nurse commences rehabilitation in the patient's new life by reorganizing the maintenance process of the individual or providing an immediate protective care in the initial phases of an illness or an accident. The disabled person's existing capacity should be considered holistically. A rehabilitation nurse provides care, training and support for individuals and their families. In addition, it is essential to regulate the adaptation process to the new role and environment, and this is provided by the rehabilitation nurse. According to the definition accepted by 'International Council of Nurses', rehabilitation is a special application that can be regulated as a part of care (Teasell R. 2003).

Rehabilitation nursing begins with immediate preventive care in the beginning stages of accident or illness, is continued through the restorative stage of care, and involves adaptation of the whole being to a new life. The rehabilitation nurse provides care, education, and support for the patient and the family. They play an active role in encouraging the patients to develop abilities on their own as much as possible, such as meeting basic needs, activities of daily living (eating, drinking, excretion, dressing and undressing), and taking protective measures (<http://www.brainline.org/content/2008/11/rehabilitation-on-staff-nurse.html>).

Three main points constitute the goal of rehabilitation nursing and can be summarized as "lifestyle changes in individuals", namely "**adaptation**", "**configuration of functions**" and "**upgrading autonomy**" (Hoeman 2002).

Research on the role of rehabilitation nursing has been determined to have a tendency to focus on elderly care centers and general rehabilitation nursing. The majority of them are related to ongoing interventions prescribed by doctors and physiotherapists, and they have reported a tendency to underestimate the role of rehabilitation nurses (Sylvie 2000).

There is a broad spectrum of neurological diseases in the field of rehabilitation. There may be insufficient information on the frequency of neurological disorders in the community (Newsom-Davis 1997). Today, there is an increasing number of patients with disabilities, chronic diseases, degenerative diseases, and elderly individuals in particular. However, up to 10 million people in England are expected to be affected by a neurological condition. Approximately one-tenth of these people have "head injuries" and a few million have neurodegenerative - progressive disorders, such as "Multiple Sclerosis" and "Parkinson's disease". Neurological emergencies constitute 20% of emergency room admissions.

Except for long-term care, 850,000 people need to be employed for individuals in need of neurological rehabilitation and 350,000 people for individuals who lack the ability to perform the activities of daily living due to a neurological condition ([http://www.rcn.org.uk/\\_\\_data/assets/pdf\\_file/0017/111752/003178.pdf](http://www.rcn.org.uk/__data/assets/pdf_file/0017/111752/003178.pdf)). The needs of these people, who constitute a large part of population, cannot be met in the present status. Except for stroke, there is no definitive treatment or preventive treatment for neurological conditions. Rehabilitation and support should be focused on protection and improvement of the current situation of affected individuals. Flexible, need-responsive, and individual-based studies are needed

([http://www.rcn.org.uk/\\_\\_data/assets/pdf\\_file/0017/111752/003178.pdf](http://www.rcn.org.uk/__data/assets/pdf_file/0017/111752/003178.pdf),

<http://www.sdo.nihr.ac.uk/files/adhoc/132-132-research-summary.pdf>).

### History of Rehabilitation Nursing

In the United States, the field of rehabilitation is linked most closely with, and has received its greatest impetus from, the circumstances surrounding the consequences of wartime combat. Rehabilitation principles were first applied by Florence Nightingale, who planted the seeds of rehabilitation nursing in her seminal 1859 book.

([http://currentnursing.com/nursing\\_theory/nursing\\_theorists.html](http://currentnursing.com/nursing_theory/nursing_theorists.html),

[http://www.cot.org.uk/sites/default/files/publications/public/Work\\_Matters\\_Vocational\\_Rehab\\_English.pdf](http://www.cot.org.uk/sites/default/files/publications/public/Work_Matters_Vocational_Rehab_English.pdf))

. Subsequently, the 1940s saw significant growth in the field of physical medicine. In 1945, eight individuals with Spinal Cord Injury were reported to have been administered psychosocial treatment and vocational therapy. The specialty of rehabilitation medicine became firmly established, and by 1946, physiatrists were being trained in rehabilitation medicine (Rundquist et al.2011, Chen et al. 2005).

### Rehabilitation Nursing Interventions

A rehabilitation nurse initially plays an active role in helping the patients to function at their best in meeting basic needs, in the activities of daily living (eating, drinking, excretion, dressing and undressing), and in taking protective measures for themselves.

- provides coordination with the other members of the team after assessing the nutritional status of the patient, e.g. in patients who have difficulty swallowing: nutrition may be given via IV (intravenous) route or naso-gastric probe or gastric tube.

- Toilet habits, which particularly affect the social life of the patient, should be established again.
- Maintenance and training practices for bladder emptying and urinary leakage should be performed
- For skin care and prevention of pressure ulcers, patient and family education should be provided about periods of motion limitation, care for wheelchair-bound patients, and accurate positioning.
- The patient's skin-care and self-care deficiencies should be identified and attempts should be made to eliminate the source of the problem.
- In parallel with the changing needs of the individuals, they should be given the opportunity to acquire self-care skills.
- To prevent the formation of contractures and atrophies, proper positioning and active-passive ROM exercises should take place.
- The patient should be encouraged to become independent.
- To evaluate the patient's ways of coping with stress and to help improve problem-solving skills, to support, and to direct the patient to a relevant unit if necessary.
- To provide a safe environment against infections and accidents, to ensure compliance with nursing care techniques (asepsis, sterilization, isolation, etc.), and to provide necessary treatments for isolated patients.
- For patients and their caregivers, to provide moral support and motivation, to provide consulting and education and to inform about the disease and general health issues, and to direct the relevant health professionals and institutions, if necessary,
- To record each phase of nursing applications completely and in a timely manner.
- To promote patients' social participation.
- Vital signs should be monitored.

The rehabilitation process involves the time spent in hospital and some phases after hospital discharge. The patient ultimately should return home. Although it is very important to ensure the continuity of the rehabilitation process at home, it is certain that other people will have to deal with the patient's care. In view of this process, the time spent in hospital is not too short when compared with the life remaining. Maintaining self care as much as possible, or supportive care, is the cornerstone of care. Here, the important point is the education of patients and caregivers (Portillo et al. 2005).

The common goals should be clarified to achieve success in harmony with the patient and his/her family. In rehabilitation teamwork, nurses should have a broad perspective and have the ability to foresee. The more the nurse realizes the extent of the patient's improvement, and how much more rehabilitation the patient needs to achieve maximum

improvement, the more the nurse will contribute to the rehabilitation team (Lazar 1998).

As a result, new roles and functional areas of rehabilitation nursing are emerging.

To provide effective patient and family education, the rehabilitation nurse should be sensitive, open-minded and sincere (Barthel & Mahoney 2002, Hachinski 2002).

Moreover, a few keywords to be added, may be the potential, talent, quality of life, family-centered care, welfare, cultural components of care, and integration.

A few studies focusing on the role of the rehabilitation nurse have reported that neurological rehabilitation requires more autonomy (Spasser & Weismantel 2006).

Rehabilitation nursing has been reported to have an independent professional role with a wide range of activities, such as training, consulting, communication, management, and collaboration and care giving. Similar findings were reported with regard to how rehabilitation nurses perceive their roles. In some qualitative studies, nurses reported to perceive themselves and their roles in health improvement as independent. The nurses have considered that they have a central role in all phases of rehabilitation (White et al. 2011 and Ross & Bower 1995).

**It has been reported that the role of the neurology nurse is not different from that of a rehabilitation nurse in any area (e.g. caregiving activities, education, and upgrading independence that is not specific to neurology).**

In the literature, work-related stress has been reported to be very common among rehabilitation nurses working with patients with traumatic brain injury (TBI) (Ishikawa 2011).

### **Specific Problems Concerning Rehabilitation Patients**

**Skin Care:** Rehabilitation patients may be faced with various skin problems. During periods of restricted activity and in patients who remain in bed for long periods of time, there is a risk of developing **pressure ulcers**. Changing the position of the patient in the bed, in other words, alternating between laying the patient on their right side and laying them on their left side at intervals of two to three hours would be highly beneficial for the patient. Some important points are to keep the skin clean, taking care not to load excess weight on certain areas of the body, and to use a pneumatic bed. The same risk also applies to people sitting in a wheelchair. Therefore, the pressure applied

to the patient's thigh will be reduced by placing an appropriate wheelchair cushion. In addition, fungal lesions or erythemas may occur underneath the breast in women, in the inner side of the elbows in both genders, or between the body layers in overweight individuals because of the inactivity. It is very important to keep these areas clean and dry (Bakas et al. 2002).

**Pressure ulcers:** are ulcers occurring as a result of skin and subcutaneous tissue injury due to poor circulation in the pressure area that come into contact with the bed. Common locations of pressure ulcers: hips, elbows, heels, shoulder blades, knees, protruding areas of the ankle and head, ears and sacrum. The selection of appropriate clothes, active-passive exercise, personal hygiene, and massage can be applied to protect the patient (<http://en.allexperts.com/q/Physical-Rehabilitation-Medicine-981/2008/6/Bed-sore.htm>).

**Hygiene:** Infection is one of the most common complications, especially after stroke. One of the problems of rehabilitation patients is difficulty in swallowing as well as poor oral hygiene. Difficulty in emptying the bladder following a stroke leads to the accumulation of urine and bacterial infection. Inadequate fluid intake is one of the causes of the accumulation of urine. Therefore, it is important for post-stroke patients to take plenty of fluids and to have their catheters changed within twenty days (Stiefel & Truelove 1990).

If the patient is using a cloth wipe, it is also very important to replace these cloth wipes at two to three hours intervals. This will both relieve the patient and ventilate the back of the patient. During the replacement of the cloth wipes, the urinary region and the areas that are in contact with the cloth wipes should be cleaned with wet wipes or a cotton cloth moistened with water. The perineum and the back of the patients should be checked at certain intervals if the patients are able to maintain their own hygiene (Bakas et al. 2002).

**Bathing:** After returning home, it would be beneficial for the patient to take a bath at frequent intervals (depending on the person's health status). This stimulates blood circulation and allows the opening of skin pores. The patient can spend one to two hours in the bath each day. Bath time should be a relaxing time. The healthy hand can rub and massage the opposite side. Individuals are able to regain some function of the hemiplegic hand with time. It is important to set the temperature of the water to prevent burn injuries. It may be convenient to use an

automatic, touchless sensor sink. Showering should be preferred to a bathtub. It is beneficial to apply body massage with baby oil or lanolin cream after bathing (Bakas et al. 2002).

**Bed Bath:** Water-repellent products should be placed under the patient to protect the bed. Gloves must be used during the post-toilet cleaning of the patient. The cleaning procedure must be performed from top to bottom and from interior to exterior. After controlling the room temperature, up to two thirds of the hand bath should be filled with water up to 43 to 46 degrees. The patient's body should be rinsed with soapy water from top to bottom, and from distal to proximal, and dried. The genital area should be cleaned from front to back. It is important to use a moisturizing lotion for moistening the skin (Knapp 1959).

**Toilet:** Toilet grip handles can be used to facilitate the ability to sit and stand. Sometimes, raising the toilet seat height can be of critical value (Knapp 1959).

**Eating:** Eating with other family members at the same table at home can improve the morale of the patient. In this regard, caregivers should encourage the patient. Nonfunctional body, sensory problems, difficulty swallowing and relaxed facial muscles can make it hard to eat. To divide the food into the small pieces, to use mixers when necessary, to wipe the patient's mouth with a wet wipe, and to use a smock would be useful. Oral care is an important component of eating and appetite (Knapp 1959).

**Exercise:** The aim of exercise is to regulate the distribution of oxygen and metabolic processes, enhance strength and endurance, reduce body fat, and improve muscle-joint movements. All of these benefits are necessary for good health and everyone should undertake a routine exercise program in daily life. There is no distinction between young and old people; however, strenuous exercise might have some risks. Exercising for 20 minutes or more, three times a week is sufficient. Fifteen - 25 minutes of daily exercise five or more days a week provides high level of benefits. The exercise period can be started with light warm-ups and completed with stretching exercises (Nas et al 2001).

**PEG (percutaneous gastrostomy) or nasogastric tube:** If a PEG or NG has been inserted due to poor feeding, the patient's head should be elevated at least 45 degrees during and one to two hours after feeding. Before and after each feeding, catheters should be washed with 20cc water. The catheter site must be inspected daily, and checked for swelling and

erythema, and be kept clean and dry. The catheter should be rotated around itself once a day and adhesion of the catheter to the skin should be avoided (Williams 2006, <http://www.sign.ac.uk/pdf/sign78.pdf>).

**Traveling:** If car travel is planned, it would be useful for the patient to sit in the front seat pulled back, and to place a cushion under the buttocks, a U-shaped pillow on the neck, and a pillow supporting the back of the patient. To give short breaks and to wear comfortable and loose clothing during the journey would make the journey more comfortable. It should be kept in mind that a change in air pressure in aircraft travel can have different effects on metabolism, and a medical examination should be done and necessary recommendations should be followed, e.g. wearing varicose stockings that can support venous circulation (Lapostolle et al. 2003).

**Stroke Rehabilitation:** Recovery after a stroke is associated with many factors. Stroke affects the whole body, as well as causes problems such as perception deficiencies, sensory problems, speech disorders, pain, and difficulty in performing the activities of daily living independently. The goal of rehabilitation is to ensure the return of the patient to daily life and to protect quality of life. Rehabilitation should be performed by a health care staff member experienced in hemiplegia, such as medical physical therapist, occupational therapist, speech therapist, nurse and neuropsychologist. Once the patient's condition has stabilized, it is recommended to initiate post-stroke rehabilitation. In our country, usually patients are included in a rehabilitation program in physical therapy and rehabilitation services of hospitals and in private rehabilitation centers. Rehabilitation is a costly and exhausting process. Nursing care is complex and versatile in equipped hospitals that can provide acute or chronic care, rehabilitation centers, or at home. As the stroke can affect the individual in many ways, more than one nursing diagnosis may be appropriate for the care of an individual with stroke (Wright 1999).

Motor rehabilitation should be initiated in ischemic stroke patients in the early period. Patients who receive bed rest within the first 24 hours should be mobilized in the following two to three days. Mobilization is the most important way to prevent pressure ulcers, deep vein thrombosis, atelectasis, bronchopulmonary infectious complications, and constipation. The patients that will be mobilized should be monitored for worsening of neurological signs due to orthostatism, and mobilization should be continued if the neurological status does not change.

Mobilization alone should not be allowed because of the high risk of falling. It is important for bed-bound patients to alternate sides at short intervals and to use pneumatic beds for pressure ulcer prophylaxis. In order to prevent contractures and orthopedic complications, active or passive ROM exercises should be used for paretic arms and legs. Most stroke patients have difficulty swallowing in the acute phase, and feeding should not be delayed in these patients. In the early period, nasogastric tube or enteral nutrition via gastrostomy can be considered. Oral feeding should not be initiated in any of the stroke patients without the evaluation of the swallowing function. The prognosis of aspiration pneumonia can be worse in patients with impaired swallowing (Teel et al. 1999).

### **Nursing Interventions**

It is noteworthy that publications on rehabilitation nursing practices are usually international and related to stroke. Studies generally examine issues of nursing care and patient education (Burton CR. 2003). In different studies, different assessments have been made on the impact of stroke support groups, self-care skills and perceptions of the patients. In the studies, specific therapeutic applications, such as bowel management, feeding and laughing are mostly included in individual nursing practices. Moreover, the studies have evaluated the differences between conventional nursing approaches and semi-experimental models (<http://www.free-ed.net/sweethaven/MedTech/NurseCare/NeuroNurse01.asp>, Williams et al. 2009).

The needs of rehabilitation nurses are not precisely defined. For example, the standardization of a guide including behavioral and cognitive factors will be helpful for rehabilitation nurses in terms of the care needs of patients with neurological disability. Thus, the outcome of care can be measured.

Large-scale prospective studies on different cultures will be more informative. In many rehabilitation units, nurses prepare the patient before the application. In addition, in some units, a taxonomic guide can be used. Especially in studies focused on stroke, when "the perception of patients" for the nurses working with patients with depression after stroke is evaluated, nurses have been found to listen to and support the patients by encouraging them to speak (Bennett 1996).

### **The Family of the Rehabilitation Patient**

The patient's family plays an important role in rehabilitation. To have a relevant and resourceful family that can provide care is an important factor

affecting the rehabilitation process positively. What kind of problems the patient may experience and how these problems affect the patient should be explained to family members. In this way, it will be easier for the family to find solutions after the discharge.

If you are a relative of someone in need of rehabilitation, you should support and encourage him. You should not leave the patient alone in hospital or the rehabilitation center, and should make him/her feel that you are with them. Watching television, listening to the radio, playing chess or card games with family members may make the patient more comfortable. This is a good way to learn how rehabilitation works and how you can help the patient to do better.

It is of utmost importance in rehabilitation to help and encourage the patient to apply relearned skills. A patient diary can be used to clarify what the patient can do alone and what they can do with support. In this way, the patient's family can refrain from executing actions that the patient can do alone. The patient's self-confidence will increase as he/she performs tasks without help. Long-term care and rehabilitation needs can create pressure and despair in patients and their families. Stroke, spinal cord injury and traumatic brain injuries happen so quickly and everybody may be shocked. At the end of the acute period, the most important partner of the health care team is the family. Early inclusion of family members in care interventions will facilitate the long-term struggle with the disease and create an efficient climate of trust. To take a patient approach to problem solving, to offer alternative solutions, and to provide psychological support for the patient and family in long term disability is an important task of health personnel dealing with stroke. In short, it is obvious that the patient's family need to be informed to adapt to the new condition in the early period. In recent literature, the amount of research concerning the patient and family is increasing. In these studies, the education needs of the family of the rehabilitation patients have been mentioned, and the participation of the family in the rehabilitation process has been reported to be important (Wright et al. 1999, Crotty et al. 2003, Zinzi et al. 2009, <http://www.mageerehab.org/caregivers.php>, [http://www.ohioafp.org/pdfs/symposium\\_pres/Kelly\\_Koenig.pdf](http://www.ohioafp.org/pdfs/symposium_pres/Kelly_Koenig.pdf)).

Informal care-givers have been reported to be willing to participate in patient care. Family support has been emphasized to be important in the publications, despite its limitations. More comprehensive research that can clarify this issue may be proposed.

## Conclusion

An efficient information network can be created in the field of rehabilitation nursing.

For stroke, cost-effective models can be compared with community-based rehabilitation practices. For neurological conditions other than stroke, well-designed randomized controlled trials and economic evaluation of the service can be carried out.

Patient records related to the long-term care needs involved in the rehabilitation of patients can be created. The importance of these records should be taken into account for the continuity between phases of rehabilitation and service provision.

Volunteer services and web and telephone services can be used more efficiently. Home care can be an alternative to hospital care for patients and their families.

Community-based rehabilitation and therapeutic interventions can be tried for Parkinson's disease, spinal cord injuries and multiple sclerosis.

Follow-up at home can be recommended for epilepsy.

Qualitative studies can be offered to assess the rehabilitation needs of all groups.

## References

- Bakas T, Austin J, Okonkwo KF, Lewis R, Chadwick L. (2002) Needs, concerns, strategies, and advice of stroke caregivers the first 6 months after discharge, *J Neuroscience Nurs* 34: 242–252.
- Barthel M, Mahoney K. (2002) Agency For Health Care Policy And Research Publication. After Stroke Recovery Patient Guidelines Booklet; Government Printing Office Washington Dc. 23–27.
- Bennett B. (1996) How nurses in a stroke rehabilitation unit attempt to meet the psychological needs of patients who become depressed following a stroke, *Journal of Advanced Nursing*, Volume 23, Issue 2, pages 314–321, February.
- Burton CR. (2003) Therapeutic nursing in stroke rehabilitation: a systematic review, *Clinical Effectiveness in Nursing* 7, 124–133.
- Chen H-Y, Boore JRP, Mullan FD. (2005) Nursing models and self-concept in patients with spinal cord injury—a comparison between UK and Taiwan, *International Journal of Nursing Studies* 42;255–272.
- Crotty M, Whitehead C, Miller M, Gray S. (2003) Patient and Caregiver Outcomes 12 Months After Home-Based Therapy for Hip Fracture: A Randomized Controlled Trial, *Arch Phys Med Rehabil* Vol 84, August.
- Green Wood R., Barnes MP., McMillan TM., Ward CD. (1997) *Neurological Rehabilitation*, pp:356-373 Taylor&Francis Pub..
- Green R, Forster A, Bogle S, Young J. (2002) Physiotherapy for patients with mobility problems more than one year after stroke: a randomised controlled trial. *The Lancet* 359: 199–203.
- Ishikawa F; Suzuki S., Okumiga A., (2011) Shimizu Y., *Rehabilitation Nursing, Writers' Award Winner Experiences of Family Members Acting as Primary Caregivers for Patients with Traumatic Brain Injury*, March 1.

- Hachinski V. (2002) Advances in stroke 2002: Introduction. *Stroke*; 34: 323.
- Hoeman SP. (2002) Rehabilitation nursing: process, application, & outcomes. 3rd ed. St. Louis, Mosby pub.  
<http://www.brainline.org/content/2008/11/rehabilitation-staff-nurse.html>.  
[http://www.rcn.org.uk/\\_\\_\\_data/assets/pdf\\_file/0017/111752/003178.pdf](http://www.rcn.org.uk/___data/assets/pdf_file/0017/111752/003178.pdf).  
<http://www.sdo.nihr.ac.uk/files/adhoc/132-132-research-summary.pdf>.  
[http://currentnursing.com/nursing\\_theory/nursing\\_theorists.html](http://currentnursing.com/nursing_theory/nursing_theorists.html),  
 Notes on Nursing: What Is It and What It Is Not.  
[http://www.cot.org.uk/sites/default/files/publications/public/Work\\_Matters\\_Vocational\\_Rehab\\_English.pdf](http://www.cot.org.uk/sites/default/files/publications/public/Work_Matters_Vocational_Rehab_English.pdf).  
<http://en.allexperts.com/q/Physical-Rehabilitation-Medicine-981/2008/6/Bed-sore.htm>.  
<http://www.sign.ac.uk/pdf/sign78.pdf>.  
<http://www.free-ed.net/sweethaven/MedTech/NurseCare/NeuroNurse01.asp>  
<http://www.mageerehab.org/caregivers.php>.  
[http://www.ohioafp.org/pdfs/symposium\\_pres/Kelly\\_Koenig.pdf](http://www.ohioafp.org/pdfs/symposium_pres/Kelly_Koenig.pdf),  
 Koenig K N., information needs reported by informal caregivers of dementia versus rehabilitation patients.
- Knapp ME. (1959) Problems In Rehabilitation Of The Hemiplegic Patient, *J Am Med Assoc*. 169(3):224-229
- Lazar RB., (1998) Principles of neurologic rehabilitation, McGraw-Hill, Health Professions Division, pp:29.
- Lapostolle F., Borron S. W., Surget V., Sordelet D., Lapandry C., Adnet F. (2003) Stroke associated with pulmonary embolism after air travel, *Neurology* June 24, 60:1983-1985.
- Nas K, Gur A, Orkun S, Ataoglu S, Ozgirgin N, Satici O, Erdogan F (2001) Hemiplejik hastalarda sakatlık listesi ve rehabilitasyon sonuçları. *Fiziksel Tıp ve Rehab Derg*; 5: 47;3.
- Newsom-Davis J, Hopkins A. (1997) Neurology and public health in the United Kingdom—conclusion. *J Neurol Neurosurg Psychiatry* 63 Suppl 1: S65–6.
- Portillo MC, Corcho'n S, Lo'pez-Dicastillo O, Cowley S. (2009) Evaluation of a nurse-led social rehabilitation programme for neurological patients and carers: An action research study, *International Journal of Nursing Studies* 46 204–219.
- Rehabilitation nursing(2006) —Editoryel: A final frontier? *International Journal of Nursing Studies* 43 787–789.
- Ross F. & Bower P. (1995) Standardized Assessment for Elderly People (SAFE) – a feasibility study in district nursing. *Journal of Clinical Nursing* 4, 303–310.
- Rundquist J, Gassaway J, Bailey J, Lingefelt P, Reyes IA, Thomas J., (2011) The SCIREhab project: treatment time spent in SCI rehabilitation. Nursing bedside education and care management time during inpatient spinal cord injury rehabilitation. *J Spinal Cord Med*. Mar;34(2):205-15.
- Spasser MA., Weismantel A. (2006) Mapping the literature of rehabilitation nursing, *J Med Libr Assoc*. April; 94(2 Suppl): E137–E142.
- Stiefel DJ., Truelove EL. (1990) The role of rehabilitation dentistry - good oral health and hygiene for people with disability contributes to rehabilitation, / *American Rehabilitation* / Autumn.
- Sylvie Thorn S., (2000) Neurological rehabilitation nursing: a review of the research, *Journal of Advanced Nursing*, Volume 31, Issue 5, pages 1029–1038, May.
- Teasel R. (2003) Managing the stroke rehabilitation. In: Teasel R, Doherty T, Speechley M, Foley N, Bhogal SK, editors. Evidence Based Review of Stroke Rehabilitation. Ontario; p. 1-17.
- Teel CS, Duncan P, LaiSue M. (1999) Caregiving experiences after stroke. *Rehabilitation Nurs*; 20.
- Williams LS. (2006) Feedings Patients After Stroke: Who, When, and How, January 3, vol. 144 no. 159-60.
- Wright LK., Hickey JV., Buckwalter KC., Hendrix SA., Kelechi T. (1999) Emotional and physical health of spouse caregivers of persons with Alzheimer's disease and stroke, *Journal of Advanced Nursing*, Volume 30, Issue 3, pages 552–563, September.
- Williams H, Harris R, Turner-Stokes L. (2009) Work sampling: a quantitative analysis of nursing activity in a neuro-rehabilitation setting, *Journal of Advanced Nursing* 65(10), 2097–2107.
- White MJ; Gutierrez A; Davis K; Olson R; McLaughlin C., (2011) Delegation Knowledge and Practice Among Rehabilitation Nurses *Rehabilitation Nursing*, January 1.
- Zinzi P, Salmaso D, Frontali M and Jacopini G. (2009) Patients' and caregivers' perspectives: assessing an intensive rehabilitation programme and outcomes in Huntington's disease, *J Public Health* 17:331–338.