Nurse’s roles in early rehabilitation of stroke patients in hospital settings: A literature review

Jakke Elmeri Kokkonen

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Description

Kokkonen Jakke Elmeri

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Abstract

Stroke is a major health problem that affects a large part of the community with high incidence and mortality rates, and causes disability, functional issues in patients suffering from it.
Post-stroke disability impairs and causes difficulties in everyday life and chores and the quality of life of patients, affects the life of patients' relatives, and leads to both socioeconomic and social problems in the long run. The target in stroke rehabilitation is to enable the highest functional independence level possible for the individual and give tools to cope with usually a lifelong disability in some cases and to improve the quality of life despite the current limitations a patient is facing after this health incident.
The purpose of the thesis is to find out how early nursing interventions and early rehabilitation methods can impact the patient's recovery process.
A design for this nursing thesis is a literature review. The analyzed five articles were selected based on how well they fitted the topic and the databases for finding these articles were CINAHL Ultimate, Medline and PubMed. The content analysis was conducted to analyze original information fitting for the theme of the thesis.
The results suggest that early interventions and rehabilitation has a positive impact on patients functional and recovery process. Exercise which involves the individual with right treatment of stroke rehabilitation have found to have positive outcomes in the long run.

Keywords/tags

stroke, neurology, rehabilitation, interventions

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Contents

1 Introduction 2
2 Stroke 3
2.1 Stroke sub types 4
3 Risk factors for stroke 5
3.1 Gender 6
3.2 Hypertension 6
3.3 High blood fats (hypercholesterolemia) 7
3.4 Diabetes 7
3.5 Smoking 8
3.6 Atrial fibrillation and other cardiac conditions 9
4 Stroke rehabilitation 9
4.1 Hospital and community settings in rehabilitation 11
4.2 Where Rehabilitation Takes Place? 11
5 Who is Involved in Rehabilitation? 12
5.1 Community Settings 13
6 Resources and Timing 13
6.1 Resources 13
6.2 Timing 14
7 Roles of Patients and Families 14
7.1 Families 14
8 Aim purpose and research question 14
8.1 Methods 15
8.1.1 Literature review 15
8.1.2 Data search 16
8.1.3 Data selection 17
8.1.4 Data analysis 19
9 Results 19
9.1 Stroke rehabilitation 20
9.2 Nutritional status with functional recovery 21
9.3 Risk prevention and management 21
9.4 Effective rehabilitation time 21
9.5 Physical activity and rehabilitation 22

10 Discussion..... 22

11 Ethics..... 23

12 Conclusion..... 24

13 References..... 25

Appendix 1. Title of the Appendix..... 29

Figures

Tables

1 Introduction

Neurological patient benefits from individual rehabilitation carried by a multidisciplinary team regardless of the patient's age, gender or depending on the severity cerebral infarction the patient has suffered. Mortality rate and staying in a permanent institutional care are lower when the patient has been cared in a multidisciplinary team in the early stages of the illness, compared to patient's treated in a normal ward. The effectiveness of the care path can be seen as a shorter period in a rehabilitation ward, having less disability and overall, a better quality of life. (Käypä hoito, 2016). Consideration of functional ability of the patient is important in active and early rehabilitation. It is important to support the patient with the illness to participate in their own living environment according to their own capabilities and functional well-being. The aim is to restore patients' functional capacity as near as possible to the starting point where the patient begun before the illness. The aim is also to minimize the harm through training and using of assistive tools or activities that compensate for the current state of the patient. (Käypä hoito, 2016).

The rehabilitative working approach supports the patient's own capabilities, resources and independence. The goal is to achieve the best possible functional ability for the patient with the early treatment to handle and cope with the struggles of day-to-day life, activities and the best possible control of his own life. The patient is allowed to as much as possible within his own limits. Patient is being helped if necessary and guided to use both of his hands for two-handed activity. In any case, patient needs support and guidance when using the hemi side in daily activities and noticing that side during the activity. (Ahonen, 2015).

Rehabilitation of the patient starts immediately during the first day at the ward. Patient who is unable move out of the bed is rehabilitated with posture treatments in bed and assisted with different movement treatments. Orientated, conscious and patient who co-operates with the staff is actively participating in his own rehabilitation. Posture therapy aims to prevent incorrect positions, wrong trajectories, joint pain and stiffness. With therapy given for postures in bed, patients own body sensations and control of the body is being improved. (Aivohalvaus, 1979).

There are many benefits of position therapy such as enhancing blood flow, prevent skin rashes and pressure ulcers and ease muscle tension for the patient. Pillows and different supportive objects can help the patient in a good position. (Hoikka, 2013).

2 Stroke

Stroke is a cardiovascular disease which is a major killer and a cause of health problem in all parts of the globe. Every year, about 12 million individuals go through either a heart attack or a stroke. These diseases are similar in the way that they affect poor as well as the rich people. Many common folk think that they are illnesses affecting usually middle-aged men, but the truth is that both men and women suffer from strokes as well as heart attacks. For women the risk increases after menopause. (Mendis&Webber,2024).

The brain can only function properly if it's getting blood flows through it constantly. There are two large blood vessels, which run along either side of the net, keeping the blood flow going from the heart to the brain. The blood vessels branch off and get smaller and even more tiny, until tiny blood vessels carry oxygen and needed nutrients to all parts of the brain. This is how a normal brain functions daily for a healthy individual. During a stroke blood flow to the brain is cut off and the brain loses its oxygen and nutrients supplications. This causes the damage to the brain tissue that we call a stroke. (Mendis&Webber,2024).

Blockage of the cerebral artery which we call a stroke is the most common cerebral circulatory disorder. If the blockage does not open quickly enough, some of the brain tissue will be left without proper blood flow and it will die. This blockage can be caused by various reasons which are treated all differently. (HUS Neurokeskus, 2023). Most common reason for this blockage to occur is from a build-up of fatty deposits on the inner walls of the blood vessels that keep continues distribution to the brain. Fatty deposits in the blood vessels can cause them to get more narrow and less flexible. It is sometimes also called hardening of the arteries or atherosclerosis. This can cause the blood vessels more likely to get blocked by blood clots. If a blood clot stops blood flow to the brain, blood vessels cannot supply blood to the brain, and it cause damage to the tissue. (Mendis&Webber,2024).

Strokes can be caused by two other ways also. A blood vessel in the brain can erupt and bleed, causing damage to the brain tissue. This phenomenon is also called intracerebral hemorrhage. There are many risk factors which can lead up to this, but an important risk factor for this is high blood pressure which damages the veins. If a person has a weak or irregular heartbeat, blood clots might form in the heart and travel through the blood vessels to the brain. These clots can get stuck

in the tapered brain artery and blocking the blood flow, which causes a stroke since blood doesn't flow to an area of the brain. (Mendis&Webber,2024).

The most common symptom of a stroke is sudden weakness of the face, arm or leg and most of them happening on the other side of the body. There are other symptoms including sudden onset of: numbness of the face, lip, arm or leg and especially happening on one side of the body. Confusion, slurred speech, difficulty in speaking and or understanding speech. Individual might drool and the speech becomes hard to understand or recognize. Visual impairments might occur, difficulty of seeing with one or both eyes, double vision or blurred vision. Walking might be affected with dizziness, loss of balance and coordination and waking itself can be difficult or not possible. Other neurological symptoms such as severe headache with no known cause, fainting and even losing consciousness. The effects coming from a stroke is dependent on in which section of the brain is injured and how severe it is affected. A stroke might affect just one part of the body, but also completely paralyzed one side of the body such as a leg, arm or face. A very severe stroke is dangerous and can cause death suddenly. When seeing someone suffering from clear signs of stroke it is important to react fast and call for help. Calling ambulance right away or take the individual to a nearest hospital for treatment is important even if the symptoms are not severe since stroke might progress and cause damage or even permanent damage (Mendis&Webber,2024).

2.1 Stroke sub types

For stroke are ischemic stroke, hemorrhagic stroke and transient ischemic attack or known as the TIA attack. Ischemic stroke is the most common type, accounting for about 80% of all strokes happening. It happens when a blood clot blocks a blood vessel or artery in the brain and causes an area not getting blood flow or oxygen. Arteries are the blood vessels that supple blood from the heart to the brain and rest of the body. There are different options that can cause ischemic strokes, such as thrombosis, embolism and stenosis.

Thrombosis means when a clot develops within a diseased blood vessel of the brain and becomes so big that the blood flow to the needed area is cut off completely.

Embolism means when a clot forms in another part of the body (such as heart) and moves into the narrow arteries of the body and causes a blockade.

According to National institute of Neurological disorders and stroke:" Stenosis means that an artery in the head or neck is narrowing. Most common one is atherosclerosis which means that the plague collected along the inside of arteries is causing a thickening a hardening and loss of elasticity in the walls. Atherosclerosis of heart vessels can be a cause of heart attack too. Ischemic stroke can also provoke inflammation, swelling (edema), and other processes that can continue to cause damage for hours to days after the initial stroke. In large ischemic strokes, the swelling can cause the pressure inside the skull to rise to dangerous levels. "(NINDS, 2024).

Hemorrhagic stroke means when an artery in the brain erupts and burst, blood spreads into or around the brain, damaging the surrounding brain tissue. The blood while entering the brain increases the pressure inside the skull which can cause significant tissue damage. The two types of hemorrhagic strokes are intracerebral hemorrhage (within the brain) or subarachnoid hemorrhage (between the inner and outer layers of the tissue covering the brain). (NINDS, 2024).

Transient Ischemic Attack (TIA) is a temporary interruption of blood flow to the brain, often caused by a clot which moves after some time. After the blockage dissipates, stroke symptoms will disappear quickly. Any stroke damage after a TIA is typically short term and is not visible on brain imaging such as MRI screening. However, TIA can be an important warning sign that a larger, more serious stroke could come soon. (NINDS, 2024). Minor stroke or TIA has similar features as a major stroke, but the symptoms are milder and last for a short period of time, usually less than hour. In many cases the individual recovers without treatment. These TIA attacks are warning signs, most people after receiving a TIA will later have a major stroke. It's worth noting that a person might still suffer a major stroke without having had any minor strokes such as a TIA. (Mendis&Webber,2024).

3 Risk factors for stroke

There are various risk factors where some of them can be influenced by your own personal choices and then there are stroke risk factors which are not within your own control. Risk factors which a person has no impact are for example age, gender, heritage and ethnic background. Age is a major factor in all arterial diseases, cerebral artery occlusion and in cerebral hemorrhage.

Some of the risk factors a person can control with life choices such as high blood pressure, smoking, diabetes, high cholesterol, obesity and physical inactivity and excessive alcohol intake. Some of the risk factors are uncontrollable like: Age, gender, family history, race and ethnicity. (HUS Neurokeskus,2023).

The aftermath from stroke can be devastating; however, stroke can be very well prevented. The identification and recognition of risk factors for stroke is there, so it is important for the primary prevention of stroke. It is widely known that many factors contribute to for the risk getting a stroke, and these are generally divided into two categories: modifiable and nonmodifiable which means factors which a person can have an impact and factors that a person have no control over. Age, gender and ethnicity are nonmodifiable risk factors for stroke. Modifiable or risk factors that an individual can impact include physiological and environmental factors. These include hypertension, smoking, diabetes, heart disease, poor nutrition, physical inactivity and obesity. The WHO risk calculation charts for cardiovascular and cerebrovascular diseases for all regions of the world are useful guide to estimate individual stroke risk. (Ovbiagele, B. (Ed, 2013).

3.1 Gender

Men has higher risk in getting a stroke than women. Under the age of 75-year-old the risk in twice as big compared to women. Women usually get stroke when they are older, and the risk is higher compared to men after the age of 85-year-old. A systematic review of mainly western European studies provided clear evidence of gender differences. (Käypä Hoito, 2023).

3.2 Hypertension

One of the biggest reasons for stroke to occur is high blood pressure also known as hypertension. Hypertension is the most significant modifiable stroke risk factor. It is usually defined as blood pressure above 140/90 mmHg. Blood pressure between 120/90 and 140/90 is known as prehypertension which can lead to hypertension if the common risk factors such as obesity, high salt intake, lack of physical activity, elevated stress levels, smoking and secondary medical conditions with an individual is taking place in everyday life. (Ovbiagele, B. (Ed, 2013, page 23). Hypertension is also the most dangerous risk factor for all different types of strokes and cerebral diseases. High blood pressure exacerbates atherosclerosis in the penetrating end arteries of the brain, creating a higher

risk of the arteries inside of the brain to get narrower. The risk of stroke has been found to exacerbate highly and without stopping when the blood pressure is above 115/75 mmHg, and this phenomenon is consistent throughout sex, age and region. It is found that for stroke the increased systolic blood pressure is more important risk factor for stroke than increased diastolic blood pressure. Hypertension control has increased and improved over the last two decades, but still the generality of the illness is increasing worldwide. Reason for this are that obesity and lack of physical activity has been getting worse during the two decades. Because of this, it is a necessity to propose lifestyle changes as a means of blood pressure reduction for those individuals who are getting close or are in the prehypertension group (blood pressure between 120 and 139 mmHg and diastolic blood pressure between 80 and 89 mmHg) who are still at a greater risk of stroke than the overall population. (Ovbiagele, B. (Ed, 2013), page 23).

3.3 High blood fats (hypercholesterolemia)

Cholesterol is found being associated with ischemic stroke and it increases the risk of stroke. Evidence has been found that increased HDL levels cholesterol is associated with the change of having a stroke. High-density lipoprotein (HDL) is well known as the “good cholesterol”. Low levels of high-density lipoprotein in the arteries have known to increase the risk of stroke (Ovbiagele, B. (Ed, 2013), page 23). HDL regulates LDL storage and promotes the excretion. LDL cholesterol causes atherosclerosis. Blood fats contain substances such as cholesterol and triglycerides. When a person has too much of these fats in the bloodstream, they can build up fats inside the arteries which can lead up to atherosclerosis (hardening and narrowing of the arteries). Atherosclerosis increases the risk of having heart attacks and strokes. (Galbraith et al,2007).

3.4 Diabetes

Diabetes itself occurs when the body can’t produce enough insulin or cannot properly use it. Lack of insulin will lead to sugar building up in the bloodstream. There are two types of diabetes. Type 1 Diabetes and type 2 Diabetes. (Mendis&Webber,2024).

A major risk factor for stroke where an individual can have an impact including hypertension, smoking and dyslipidemia is diabetes. Diabetes itself occurs when the body can't produce enough insulin or cannot properly use it. Lack of insulin will lead to sugar building up in the bloodstream. There are two types of diabetes. Type 1 Diabetes and type 2 Diabetes. (Mendis&Webber,2024). Diabetes is well known risk factor, and it can cause pathologic changes in blood vessels in many parts of the body and can cause a stroke if the cerebral vessels are affected directly. In addition, mortality is higher and post symptoms and outcomes are worse when a patient has higher blood glucose levels and which are not controlled properly. Having diabetes and blood glucose levels under control and supervised well is effective way of preventing initial stroke happening as well as stroke recurrence. There are several ways where diabetes can lead to having a stroke. Diabetes can lead to systemic inflammation, arterial stiffness which can both lead to condition called atherosclerosis for example. Diabetes which isn't controlled can put a person at risk for ischemic and hemorrhagic stroke. Hyperglycemia happens when the blood glucose level is too high, and it is common phenomenon presented in the early acute stroke phase. It could be connected with non-fasting state and stress reaction with glucose metabolism is damaged. Well controlled glucose with lifestyle changes, medication and modification of other risk factors what can be affected by the individual such as blood pressure and dyslipidemia are great steps when preventing stroke from happening. (Chen,2017).

3.5 Smoking

Smoking is one of the most known factors as well when it comes to risk factors for stroke. It is linked with increased risk of stroke, and it has been shown to enhance blood pressure, heart rate and decrease cerebral blood flow. Like other risk factors, smoking can cause development of arthrosclerosis and increase risk of ischemic stroke. There is population-based evidence which suggests that not only direct smoking can increase the risk of having stroke, but also passive smoking is harmful in this case. (Chen,2017)

Tobacco itself has a lot of harmful substances that damages the lungs, blood vessels and heart. They steal space from the oxygen in the blood that brain and heart need to function properly. Smoking and use of tobacco increases changes of getting stroke highly and causes cancer and lung diseases. (Mendis&Webber,2024).

3.6 Atrial fibrillation and other cardiac conditions

Atrial fibrillation ion is a medical condition which can cause embolism in the small arteries of the brain. AF is a cardiac arrhythmia and due to formation of thrombi it might cause an embolism in the left atrial appendage. (Chen,2017). In atrial fibrillation the heartbeat is irregular, and the heart doesn't contract as well as it should be contracting. This phenomenon can cause embolism and blood to pool in the heart and form clots which are dangerous. When the clots start moving away from the heart they might move into brain, where they can be trapped in small brain artery, causing a blockade which stops the blood flow and eventually causing a stroke. As many as 20% of strokes may be caused by atrial fibrillation. (Mendis&Webber,2024).

4 Stroke rehabilitation

Rehabilitation and nursing goes in hand to hand and are ingrained together. Main goals of the rehabilitation is to improve and reaching while also maintaining optimal functioning of persons with disability and persons with health conditions experiencing disability. (C.Gutenbrunner, 2021). Nursing itself is defined as use of clinical decision making in the provision of care to enable people to improve, maintain or recover health and help patients to cope with health problems while at the same time helping them to achieve the best possible quality of life. Nursing has a significant role when it comes to different phases of the patient going through care path (acute, post-acute and long-term rehabilitation). Nurses can deliver rehabilitation in many different environments and settings, in nursing homes and for example community-based rehabilitation. The main principle in rehabilitation is to work with the patient for a common goal and not work for the patient to achieve it. This includes different steps such as explaining, demonstrating and practicing with the main goal reaching patient's independence once again. (C.Gutenbrunner, 2021).

Rehabilitation is one of the elements of Universal Health Coverage (UHC), which means that rehabilitation services must be available for every person in need worldwide (WHO 2019). Another critically crucial point is to have understanding that rehabilitation isn't just for the aftermath of the treatment that is being provided in special units or centers. Rehabilitation must be available in almost all healthcare settings and in all phases of the care when treating the patient (acute, post-acute, long-term) (Gutenbrunner et al.2018;WHO,2017a). In acute care rehabilitation different interventions can be a factor to a faster recovery and to achieve better long-term outcomes for a

number of diseases (Marti et al.2020; Rethnam et al. 2020). Rehabilitation also supports intensive care and can make the duration of intensive care shorter. In nursing, the concept of self-care is now widely taken to promote a better management of the assistance by part of the receiving end of the care. Self-care is influenced by experience, confidence, skill, function, motivation, culture, support from others, the persons own cognition, lifestyle habits and access to care given (Riegel et al. 2019). With this logic, self-care is the key component to encourage co-interventions between the recipients of care and the health professionals and between nursing and rehabilitation sciences as integrated and deeply rooted disciplines. (ARN 2014).

Early rehabilitation is highly beneficial for a patient going through stroke or transient ischemic attack (TIA). TIA refers to brains or the retinas blood circulation disturbance (also knowns as amaurosis fugax) which means blinding of the other eye for a short period of time. It's seizure, transient symptom like period, which doesn't leave permanent tissue damage and usually takes about one hour, most of the time 2-15minutes. If the seizure is taking more than few hours, it is usually referring to a neuroradiologically fresh stroke and not a TIA seizure. Past TIA seizure in connection with the symptoms and ischemic seen from brain imaging can be valid reason for repeating the same seizure. (Käypä Hoito, 2024).

Early stage rehabilitation refers for both acute and subacute period. Acute stage means a situation, where the patient status hasn't been stabilized yet. Subacute stage means the fastest phase of the rehabilitation, which on a case-by-case basis takes approximately 3 to 6 months. The most important predictive factor for rehabilitation is how severe the stroke is. Giving enough information for the patient and his family members is an important part of the rehabilitation process. (Käypä Hoito, 2024).

Early stage of rehabilitation is highly significant. Cerebral circulatory disorder usually leaves a person with long term or permanent disorders.

The need for rehabilitation and how long it is depending on the person every time. Long term rehabilitation care needs approximately 40% of the people suffering from cerebral circulatory disorders. Rehabilitation which has been started in the early stages of care gives the best results. For every patient there will be made personal care plans already in the acute hospital settings and

when the status has been stabilized. Rehabilitation is continued after the hospital care depending on the patient's situation. Need for further rehabilitation is evaluated personally. (Aivoliitto, 2024).

When it comes to the acute state of rehabilitation, the first day is the most critical time for the patient. Symptoms are worsening most often during the first days after cerebral circulation disorder. Neurologist examinates the patient once a day. During other times, a nurse is following the patient and his health. (Terveyskylä, 2018).

4.1 Hospital and community settings in rehabilitation

Stroke rehabilitation is a multifaceted process aimed at helping stroke survivors regain independence and improve their quality of life. The rehabilitation process involves various therapies tailored to the individual’s needs:
Physical Therapy is important, and it focuses on improving movement, balance, and coordination. Exercises may include walking, stretching, and strength training with patients own limits with the help of a professional.
Occupational Therapy helps patients perform daily activities such as dressing, eating, and bathing. Therapists may also recommend adaptive equipment. This therapy can also train the patient in learning motorial skills again and relearning task what patient have done in home environment, for example making coffee.
Speech and Language Therapy is important in rehabilitation. It addresses communication difficulties and swallowing problems. Techniques may involve speech exercises and alternative communication methods, for example use of pictures to express themselves if the speech is not possible.
Psychological Therapy provides support for emotional and mental health issues, helping patients cope with the changes brought by a stroke. (NICE guideline, 2023).

4.2 Where Rehabilitation Takes Place?

Rehabilitation can occur in various settings, depending on the severity of the stroke and the patient’s needs. Inpatient Rehabilitation Facilities (IRFs) provide intensive therapy and medical care. Patients typically stay for a few weeks and receive several hours of therapy each day.

Skilled Nursing Facilities (SNFs) offer less intensive therapy than IRFs but still provide necessary medical care and rehabilitation services what the patient needs at that moment.
Outpatient Rehabilitation means that patients visit a clinic or hospital for therapy sessions but live at home. This setting is suitable for those who need ongoing therapy but do not require 24-hour care and can manage their daily lives mostly by themselves.
Home-Based Rehabilitation means that therapists visit the patient's home to provide therapy. This option is convenient for patients who have difficulty traveling to a facility.
(NICE guideline, 2023).

5 Who is Involved in Rehabilitation?

A multiprofessional team approach is essential for effective stroke rehabilitation. This team typically includes several key members to help the patient in rehabilitation.
Nurses provide daily care, distribution of medicine, monitor patient progress, and coordinate with other team members such as doctors and therapists. Physicians oversee medical treatment and make critical decisions about patient care and do decisions about the medication used for patient. Physical Therapists help patients regain movement and strength with various exercises daily and help to regain strength. Occupational Therapists assist with daily living activities and adapting to physical limitations and create different tasks which can help to regain lost skills, for example motorial skills and hand movements. Speech and Language Therapists works on communication skills and swallowing issues. Psychologists address emotional and mental health needs and offer mental health support for the patient. Interdisciplinary Team Meetings are regularly scheduled to meet and talk among healthcare professionals to discuss patient progress and adjust the rehabilitation plan as needed (NICE guideline, 2023).

5.1 Community Settings

After discharge from the hospital, rehabilitation continues in community settings, which may include outpatient clinics, home-based therapy, and community rehabilitation centers. These settings provide ongoing support and therapy to help patients transition back to their daily lives. Key components include:

Outpatient Therapy: Regular visits to a clinic for continued therapy sessions.

Home-Based Therapy: Therapists visit the patient's home to provide personalized care.

Community Programs: Support groups, educational programs, and community centers that offer additional resources and social support. (Winstein, 2016).

6 Resources and Timing

6.1 Resources

Effective stroke rehabilitation requires access to various resources, including:

Multidisciplinary Teams include doctors, nurses, physical therapists, occupational therapists, speech therapists, psychologists, and social workers. This team approach ensures comprehensive care and addresses all aspects of recovery for the patient and together create a plan which helps the patient in recovery.

Technology can be used to help the patient in various ways. Tools like telehealth services and rehabilitation apps can supplement traditional therapy and be great asset even after discharge from the hospital. These technologies make rehabilitation more accessible and allow for continuous monitoring and support. Different tools in hospital settings can be used to make the recovery easier and faster also. Stroke patients who are paralyzed can use assistive tools to button shirts, grab things further for example. (Winstein, 2016).

Community Resources: Support groups, educational programs, and community centers can provide additional support and resources. These resources help patients and families connect with others who are going through similar experiences. (Winstein, 2016).

6.2 Timing

The timing of rehabilitation is critical for optimal recovery. Early rehabilitation, ideally starting within 24-48 hours after a stroke, is crucial for the best outcomes. The intensity and duration of rehabilitation depend on the patient's condition and progress. Typically, patients receive several hours of therapy each day, five to six days a week. The rehabilitation process can continue for months or even years, depending on the severity of the stroke and the patient's progress. (Winstein, 2016).

7 Roles of Patients and Families

Patients' Active participation in therapy is essential for stroke survivors. Setting personal goals and working towards them can significantly improve outcomes. Patients should communicate openly with their healthcare team about their progress and any challenges they face. Staying motivated and engaged in the rehabilitation process is crucial for achieving the best possible recovery. (Winstein, 2016).

7.1 Families

Families play a vital role in the rehabilitation process. They provide emotional support and assist with daily activities. Families can also help by learning about stroke and rehabilitation to better support the patient. They play a crucial role in encouraging and motivating the patient throughout the recovery process. Additionally, families can participate in therapy sessions and learn techniques to assist the patient at home. (Winstein, 2016).

8 Aim purpose and research question

The aim of this literature review is to establish nurses' roles in early rehabilitation of stroke patients in hospital settings. The purpose is to better patients' recovery and coping with rehabilitation challenges and enhance the role that nurse splay in patient early rehabilitation. This literature

review answers to the question: What are the roles of nurses in early rehabilitation of stroke patients in hospital settings?

8.1 Methods

8.1.1 Literature review

This study uses a common method what is called a literature review. Literature review is being defined as a way to explain research findings and methods what has been found in already existing literature that is close related to the topic. The method also involves systematically searching, selecting and analyzing relevant literature to answer the research question. Literature review is supposed to help with reviewing, criticize and give new perspectives to the subject (Torraco, 2016). Literature review method has been found to have many positive sides when it comes to reviewing scientific topics. Researchers are able to use already existing material instead of having to do repetitive work again in order to find answers. Also, making a literature review gives researcher change to be familiar with the topic he has chosen to work with and increase the knowledge with it. Literature review also helps establish already well-known documents about the research subject and answering research questions (Schryen, 2015). Literature review can increase the positive way of impacting and endorsing different methodological ways to approach the chosen phenomenon. Having key words and correct terminology is essential when starting to work with research question and finding ways to describe it (Baker, 2016).

Nurses have used countless extensive nursing research and publications when it comes to working in health care but having literature reviews are essential help because they offer a lot of information which is existent knowledge and useful to use since its comprehensive evidence which has evidence based research backing it (Baker, 2016). To use a literature review with the best way possible, review a systematic three stage process has been proposed for common approval. This process has different parts such as searching, critiquing, and synthesizing (Marshall, 2010).

The steps of the literature review are searching, critiquing, and synthesizing as developed by Marshall (2010). This way has been used in answering the research question and it's more explained in up coming tables.

Searching	- Definition of inclusion and exclusion criteria in the data search part - Electronic databases - Key search terms - Search and article selection
Critiguing	- Evaluating the evidential quality of the selected text using critical appraisal tools
Synthesizing and writing	- Objective data analysis from the sources - Presentation of results and conclusions from the text

8.1.2 Data search

Data in this literature review was searched from CINAHL, Medline and PubMed. The search was done by performing a protocol according to PICOs search criteria. P for population: Stroke patients in hospital settings I for Interest: Early nursing interventions and rehabilitation Co-Context: Standard care in rehabilitation and Improved recovery and health outcomes S for Studies: Literature reviews, clinical studies, published in English and Finnish language, peer- reviewed, free access for it, full text available and published between 2010-2024.

Table 2. Inclusion and exclusion criteria of PICOs

Inclusion criteria	Exclusion criteria
- P-population: Stroke patients in hospital settings	- Studies not related to stroke rehabilitation - Studies not focusing rehabilitation and early interventions

- I-Interest: Early nursing interventions and rehabilitation - Co-Context: Standard care, improved recovery and health outcomes - S-studies: Published in English/Finnish language, peer- reviewed, free access with JAMK credentials, full text available and published between 2010-2024	- Other experiences that are not considered as stroke rehabilitation - Studies in other languages than English or Finnish, not peer-reviewed, published before 2010, will be dismissed

In this PICOs search key search terms were used that also matched with PICOs and were used during the data search. Key terms were following: stroke rehabilitation AND early intervention OR early rehabilitation. Table 3 below shows the key terms used in the search.

Table 3. Key search words

Stroke rehabilitation AND early intervention OR early rehabilitation	Key search words

8.1.3 Data selection

Data screening was done by using CINAHL and Medline databases. A total of n=651 articles were found using these databases. Medline results were 31 and CIHNAL 620. With more advanced search articles not filling the necessary information were able to be removed from the search. Data screening and selection were performed separately and together by the authors to ensure objectivity. Data analysis was tightened with more searching terms which reduced article numbers to total of n=93 articles. Medline articles 56 and CIHNAL 37. More search terms were added to reduce the number of articles to fewer and closer to the research question. N=72 articles were removed in total from databases and 21 were left. Last article screening was performed by reading title and articles not answering the research question were eliminated and at this stage a total of

n=5 articles were left. These articles were selected and analyzed. Figure 1 presents the Prisma flow chart, which shows the article screening and selection process.

Articles identified from*: Databases(N=651) Cinahl n=620 Medline n=31	Articles removed before screening: Records removed before screening: Duplicate records removed (n=6)
Articles that were not answering research question or related to the theme (n=552)	Records excluded** (n=552)
Articles sought for retrieval (n=93) Articles assessed for eligibility (n=93)	Reports excluded: 72
Articles assessed by title and eligibility (n=21)	Articles not retrieved (n=16) Reason: not answering research question
Final articles selected for review (n=5)	

Figure 1. Advanced search process

The data analysis phase is part of a content analysis process where different statistics are clarified methodically by using different various strategies. Content analysis process is a very common tool used in nursing research. (Elo & Kyngäs, 2008).

8.1.4 Data analysis

Qualitative content analysis is an analytical approach used for qualitative data analysis. Few articles have critiqued it's reliability in some cases when it comes to nursing science studies. Content analysis has different phases which can be divided into most known three phases. First is called a preparation phase which involves data preparation and decision process. Second part is organization phase which involves different parts such as categorization, abstraction and interpretation. Third part is reporting phase where process of the analysis and results are involved and told (Elo at al., 2014).

This literature review has followed these parts in making the report by Elo at al. (2014) guidelines. Articles in the beginning were chose after they were read through to see that they matched the research question and that it had key findings around it. Analysis phase was done where content was checked with inductive content analysis (Kyngäs, 2020). These analyze parts helped to choose articles supporting the literature review and the task at hand.

9 Results

Research articles which were analyzed were published at (2016), (2017), (2020),(2021), (2024). Studies were done in different parts of the world such as Poland, Japan, China, Turkey and Spain.

Table 2. below is a demonstration of the content analysis made with stroke rehabilitation as the main category and four different subcategories that are called nutritional status with functional recovery, risk prevention and management, effective rehabilitation time, physical activity and early rehabilitation.

Source	Research article themes	Category	Subcategory
Janus-Laszuk B, (2017)	Effect of medical complications on the after-stroke rehabilitation outcome	Stroke rehabilitation	
Irisawa H, (2020)			nutritional status with functional recovery
Yilei G, (2024)			risk prevention and management
SERÇE, A (2021)			effective rehabilitation time
Martínez-Velilla N, (2016)			physical activity and early rehabilitation

Table 2. A Demonstration of content analyzing

9.1 Stroke rehabilitation

Stroke is known as a leading cause of disability worldwide and after receiving stroke, the patients are at risk of developing different complications during the acute phase and later during the post-stroke rehabilitation period (Janus-Laszuk, 2017). Post-Stroke rehabilitation should beging immediately and continue while improvement is seen. Patients have a risk of developing medical complications, which can reduce optimal recovery rate (Janus-Laszuk, 2017). Understanding different medical complications what can occur can help to minimize their negative effects during rehabilitation. The decision to discharge patient from hospital is based on the individual and a prolonged hospital stay should not be a practice what is kept within routine (Janus-Laszuk, 2017)

9.2 Nutritional status with functional recovery

Previously done studies have suggested that the nutritional status after stroke is highly associated with long-term outcomes and that sarcopenia delays post-stroke rehabilitation and makes the recovery prognosis worse (Irisawa H, 2020).

Patients after suffering a stroke with hemiplegia has been reported that the muscle mass of chronic stroke patients is significantly lower on the paralyzed side (upper and lower limbs) than on the non-paralyzed side (Irisawa H, 2020). Malnutrition has been reported to be caused by starvation, different acute illnesses, and chronic illness and patients undergoing rehabilitation with stroke might suffer from these conditions. Reduction in protein associated with malnutrition may reduce muscle mass and be harmful to the rehabilitation and recovery. The results suggested that the evaluation of muscle mass related to recovery and functional abilities that nutrition intervention is necessary (Irisawa, H 2020).

9.3 Risk prevention and management

According to known information and guidelines, common cardiovascular risk factors include a stationary lifestyle, smoking, overweight, unhealthy dietary habits, diabetes and hypertension (Yilei G, 2024). Risk prediction scores or models with different screening tools such as electrocardiography (ECG), can help identify patients with high-risk score in receiving a health concerning complications and benefit from early risk management and guided preventive treatment (Yilei G, 2024).

9.4 Effective rehabilitation time

Rehabilitation after a stroke is very important and beneficial in reduction of mortality, disability and in the long term, the need for institutional care such as hospitalization (SERÇE, A, 2021).

Early intensive and multifaceted rehabilitation program is effective for motor and functional recovery in ischemic stroke patients. It was found that starting the rehabilitation within the first 9 days after stroke provides the most improvement for the patient. The early period after receiving stroke is also the best period for brains to adjust because of brain plasticity and remodeling (SERÇE, A, 2021).

9.5 Physical activity and rehabilitation

Hospitalized elderly patients arriving to the hospital are often bedridden and unable to walk. These patients have reduced functional and physiological capabilities, making them more vulnerable to the effects of been bedridden. Different problems arises when the hospital stay is longer, such as: functional loss or cognitive impairment, longer hospital stay, immobilization, mortality, poor mood, delirium, institutionalization, pressure ulcers (Martínez-Velilla N, 2016).

Introduction of an exercise program for hospitalized patients may be feasible and it may also have a positive effect in the healthcare and functional parameters for long term (Martínez-Velilla N, 2016).

Patients should begin a short daily walk inside the hospital, routes usually traveled in a wheelchair as soon as the medical condition is stabilized. Mobilization in daily tasks with assistance of nurse or physical therapist. Individual exercises for executive and cognitive functions should be offered individually and in groups. Optimizing the functional capacity of individuals, resistance training programs should include exercises in which daily activities are simulated, like standing up from a wheelchair “sit-to-stand” exercise (Martínez-Velilla N, 2016).

10 Discussion

This literature review was to show early benefits of early rehabilitation after a patient has suffered a stroke. Findings in this literature review were focusing and emphasizing the effects what early interventions can have and what positive results can happen with right approach and good interventions. Nurses have a major role in the multidisciplinary team what is built to enhance recovering process of a patient. Stroke rehabilitation requires a sustained and well operating team from the medical perspective, but also having a well supporting family and friends or other caregivers of the patient has a role to play in recovering process (Winstein, 2016).

Stroke is a major health problem in modern world which could be prevented by healthy life choices what an individual can make by themselves. Many of the health risks associated with

stroke such as high blood pressure, high blood fats and smoking are areas a person can make a difference. High blood pressure is a most common treatable condition when it comes to risk factors in stroke (Käypä Hoito, 2024).

The results of this literature review show that these health conditions could be prevented in some degree with personal choices and with knowledge about the risk factors in stroke. Evidence has shown that preventing bad habits like alcohol and tobacco already increases the chances of not receiving stroke (Käypä Hoito, 2024). There are factors what a person has no control over such as genetics, gender, race or ethnicity what could mean higher risk of having a stroke (HUS Neurokeskus,2023).

Starting rehabilitation early as possible is an effective way to recover function abilities back for the patient and reduce disabilities. Ongoing training is important part of this rehabilitation and resource limitations can challenge nurses and the multidisciplinary team in always performing the best care possible (Winstein, 2016).

11 Ethics

This literature review followed research ethics and complied with good scientific practice (TENK, 2020). Authenticity and reproducibility were ensured, and rigorous research process was used during the literature review writing. Materials concerning the writing were handled and kept in care (Smith & Noble, 2014). This literature review used literature and information gathered from different parts of the world and countries and care settings.

The limitations in this study are that the articles selected were mostly limited to hospital settings and stroke rehabilitation. Articles were published between 2016 and 2024 so some of the information might have been changed since then.

12 Conclusion

This literature review was to help and explain how early rehabilitation and interventions can benefit the patient after having a stroke and neurological impairments after that. There is evidence how interventions and multidisciplinary team can help a patient recover functional abilities and enhance recovery time when it's started early after acute care period. Early care performed by nurses has a vital role in the rehabilitation of stroke patients. Nurses' involvement in early care can lead to improved patient outcomes and give them a better overall quality of life in the future.

Healthcare organizations and hospital should put resources and guidance for nurses in how to treat patients and support them physically and emotionally after a stroke and teaching how a good early rehabilitation can reduce costs in the future for health care facilities if the patient is treated correctly and reducing the negative effects what a stroke can create. Such as immobility, depression, loss of autonomy and impaired movement capabilities can result in more costs in the health care system if not treated properly after this kind of major health incident.

Nurses have a critical role in treating stroke patients in hospital settings during acute and post-acute period, so developing protocols, giving more knowledge and training to support nurses to achieve methods in helping the patient is crucial. Future research should focus more on how to make this possible and standardized.

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Neighborhood income inequality associated with functional independence after ischemic stroke: a cohort study, Journal of Stroke and Cerebrovascular Diseases, 34, 1, (108035), (2025).https://doi.org/10.1016/j.jstrokecerebrovasdis.2

Guidelines for Adult Stroke Rehabilitation and Recovery

American Stroke Association (2020) HOPE: The Stroke Recovery Guide

American Heart Association (2020) ASA Rehab HCP–RehabProgram

Appendix 1. Title of the Appendix

Author, year and country, article name	Inquiry goals	Method and design	Sample	Main results
Yilei Guo, Danping Pan (2024), China Post-Ischemic Stroke Cardiovascular Risk Prevention and Management	Optimization of early rehabilitation care comprises continuous care across environments thus improving the prognosis of stroke survivors.	Focus on the management strategies for modifiable risk factors and the preferred treatment methods for preventing cardiovascular disease (CVD) after stroke	**No. of Patients** 300 Age ≥ 18 years; IS; excluded those previously documented AF, a pacemaker, an implantable cardioverter-defibrillator, or >7 days of post-stroke external ECG monitoring	risk scoring tools are highly practical in clinical settings because they can be obtained from routine medical records and are easy to calculate.
Janus-Laszuk, Mirowska-Guzel, (2017),Poland, Effect of medical complications on the after-stroke	Aimed to determine the incidence of complica-	The main measure of functional outcome was the discharge	For 1075 patients (585 men), we recorded neurological	At least one complication was reported by 76.9% of patients, and

rehabilitation outcome	tions occurring during early inpatient rehabilitation and to assess their influence on patients' functionality.	Barthel Index score.	deficits, activities of everyday living, functionality before and after rehabilitation, and the incidence of complications.	20% experienced three or more complications. The most common problems were: urinary tract infection (23.2%), depression (18.9%), falls (17.9%), unstable hypertension (17.6%), and shoulder pain (14.9%). Patients with a severe discharge disability were 2.5-fold more likely to experience complications than subjects with a mild disability.

Irisawa H, Mizushima T, (2020), Japan, Correlation of Body Composition and Nutritional Status with Functional Recovery in Stroke Rehabilitation Patients	This is the first study to clarify the relationships between BIA, nutritional status, and functional recovery in stroke patients. The nutritional status, muscle mass, and phase angle at the start of intensive stroke reha-	This prospective study was conducted at two stroke rehabilitation units in Japan between January 2017 and June 2018. All subjects gave their informed consent for inclusion before they participated in the study.	This prospective study included 179 patients who were admitted to the stroke rehabilitation unit.	From this study, it is clear that the nutritional status and muscle mass at the start of intensive stroke rehabilitation exerted considerable influence on functional recovery.

	bilitation exerted considerable influences on functional recovery.			
Martínez-Velilla N, Cadore EL, (2016) Spain, Physical Activity and Early Rehabilitation in Hospitalized Elderly Medical Patients: Systematic Review of Randomized Clinical Trials	To critically review the effect of interventions incorporating exercise and early rehabilitation (physical therapy, occupational therapy, and physical activity) in the functional outcomes (i.e., active daily living tests, such as Barthel Index Scores, Timed-up-and go, mobility tests),	Systematic review of the literature. A literature search was conducted using the following databases and medical resources from 1966 to January 2014: PubMed (Medline), PEDro, the Cochrane Central Register of Controlled Trials and the Cochrane Database of Systematic Reviews, Google Scholar, ClinicalTrials.gov,	From the 6564 manuscripts potentially related to exercise performance in hospitalized elderly patients	The introduction of an exercise program for hospitalized elderly patients may be feasible, and may not increase costs. Importantly, early rehabilitation may also improve the functional and healthcare.

	and feasibility in hospitalized elderly medical patients.	Clinical Evidence, SportsDiscus, EMBASE and UptoDate.		
SERÇE, A, UMAY, E. K, (2021), Turkey, Early Intensive Multi-faceted Rehabilitation in Stroke Patients: What is the Best Effective Rehabilitation Time?	Aimed to evaluate the effects of the intensive and multi-faceted rehabilitation program in patients during the first 3 weeks after stroke, and to determine the most effective time to initiate treatment.	The demographic characteristics of the patients, the level of stroke severity assessed by the National Stroke Institute Severity Scale (NIHSS), the functional stages assessed by the Brunstrom and Chedocke McMaster Stroke Assesment (CMSA) Scale and the disability levels assessed by the Functional Independence	Forty two (42) patients who were treated in our clinic were included in the study.	Early intensive and multifaceted rehabilitation program is effective for motor and functional recovery in ischemic stroke patients.

		Measure scale were recorded.		