

https://dspace.org/

Factors that influence functional independance post stroke

Mamabolo, Mokgobadibe Veronica

2007-02-22T11:51:54Z
http://hdl.handle.net/10539/2085

Downloaded from a DSpace repository. https://dspace.org/

CHAPTER 2

2. LITERATURE REVIEW

2.1. INTRODUCTION

The disability pathway of stroke survivors is different from the accepted models of disablement, in that the disability observed is not necessarily the result of the neurological deficits incurred. Older age, prevalent comorbid diseases, and sociodemographic factors were also found to have an influence on the process of disability (Kelly-Hayes et al., 2003).

Many studies of recovery after stroke have estimated the probability of achieving a certain activity of daily living, by a given time point. Such probabilities may vary according to treatment regimen or patient characteristics (Tilling et al., 2001). This approach does not allow for individually tailored predictions of functional outcome based on the patient's particular characteristics.

This review seeks to look at studies that have taken into consideration patient characteristics, and to collate, in order to find consensus on factors/characteristics that might have or might not have an influence on functional independence post stroke.

Search engines used were Pub Med and Wits Health Science Library. Sources of articles were British Medical Journal, Journal of the South African Society of Physiotherapy, National Library of Medicine, American Journal of Physical Medicine and Rehabilitation, American Heart Association and the Journal of Rehabilitation Research and Development. Search key words used were: stroke and functional independence vs. age, gender, marital status, education level, stroke subtype, hypertension, diabetes, cardiac diseases, HIV/AIDS, shoulder pain, leg pain, urinary symptoms, bowel symptoms, duration of hospitalisation, financial role, family income, caregiver, community participation, depression and emotional support.

As most of the papers reviewed were descriptive in nature, an overview of findings has been given rather than a critique on the quality of the papers.

2.2. FUNCTIONAL INDEPENDENCE AT DISCHARGE AND POST DISCHARGE

Green et al. (2005) established that stroke patients in South African private rehabilitation units are discharged from the hospital with a low functional status. Patients in this study had a hospital stay of 30-34 days. The length of hospital stay following a stroke at the Chris Hani Baragwanath hospital, which is a government hospital in South Africa, was found to be 12 days by (Hale & Eales, 1998). These studies indicate that patients from both the private and government, hospitals are discharged before they are functionally independent. Conner et al. (2004)'s study also found that 66% of the stroke survivors in their study population needed help with at least one activity of daily living post discharge.

Greenberg et al. (2004) found that stroke patients complain mainly about decreased hand function, general functional deterioration and difficulty walking during follow-up examinations, and that 58% of these complaints were resolved through community rehabilitation services. Post discharge rehabilitation, especially home based rehabilitation, results in more functional recovery after stroke (Mayo et al., 2000).

It can thus be concluded that patients generally do not have functional independence on discharge from the hospital, and can be expected to have functional independence post discharge provided they receive post discharge rehabilitation.

2.3. INFLUENCE OF DEMOGRAPHIC FACTORS

2.3.1. Age and Gender

In a study by Kelly-Hayes et al. (2003), more women experienced initial strokes and were more disabled at six months post stroke than men. However, older age at stroke onset, not gender or stroke subtype was associated with greater disability. This study also established that initial stroke occurred approximately five years later in women than in men. The older age group was found to deteriorate significantly more in activities of daily living than the younger age group (Pohjasvaara et al., 1997).
Jorgensen et al. (1999) also established that younger stroke patients had better functional outcomes.

Nakayama et al. (1994)'s study showed that although severity of neurological deficits could be the same for both genders, women were found to have more functional problems.
Age seems to contribute more than gender in predicting functional independence post stroke. Although gender was found to be a predicting factor by Nakayama et al. (1994), this can be attributed to the fact that women live longer and thus have strokes at an older age, and their functional ability deteriorates significantly in activities of living as indicated by Pohjasvaara et al. (1997). Thus if both women and men were to have a stroke at the same age, there would be no significant difference in their functional independence.

2.3.2. Marital status

Being married carries a risk for low quality of life in post stroke patients; conversely, unmarried patients cope well with their impairments (Kauhanen et al., 2000). Living with a spouse was also found to be a negative predictor of social activity in a study by Schepers et al. (2005). These studies however emphasise the need to take into consideration prestroke social activities when establishing patient relevant rehabilitation goals. In a traditional model, women do the majority of household work, leading to higher scores on functional activities post stroke, if they live with a partner, and lower scores for men living with a partner (Schepers et al., 2005).

The following reasons were attributed to poor quality of life in post stroke married patients: spouses may underestimate the need for support of patients with only mild stroke disorders, stroke may lead to changes in the interaction between spouses and in family roles, and spouses may react by being overprotective and overcaring (Anderson et al., 1995 and Kauhanen et al., 2000). However, in the absence of the above-mentioned reasons for poor quality of life in post stroke married patients, the spouse/partner can constitute another type of primary support network that has been associated with decreased mortality, particularly among men. The services provided by a marriage network include cooking, bathing, dressing and shopping; and these can improve the quality of life of the patient (Boden-Albala et al., 2005). Jorgensen et al. (1999) also established that the existence of a spouse at home increased the chance of having a good functional outcome post stroke.

Information from these studies indicates that being married cannot be considered a negative or positive predictor of functional independence without considering the pre-morbid role of the spouse or patient within the family unit. Spousal availability/absence has also been found to influence the patient's functional outcome.

2.3.3. Education level

Stroke patients, whose general education is better, seem to understand their medical condition better. In a study by Hale et al. (1999), all patients in their study were hypertensive, all on medication, and vaguely knew what the medication was for. Only two patients seemed to understand their medical condition, and these are the patients whose general education level seemed to be better.

Stewart et al. (2000)'s study showed that the education status of patients with hypertension was predictive of the knowledge they would have about their medical condition. The same study also established that patients with better knowledge had better quality of life. A better quality of life means that a patient has better functional capacity and a decrease in symptoms (Wenger (1984) in Stewart et al. (2000)).

Van Rooijen et al. (2001) stablished that low education level could be considered as a contributing factor to the lack of knowledge among black female patients with Type 2 Diabetes Mellitus. Diabetes is one of the risk factors of stroke, and thus some patients who have a stroke, are also likely to have diabetes. It can therefore be extrapolated that low education level can be a factor in the lack of knowledge about stroke among stroke patients. Patients with a higher level of education are vulnerable to post stroke depression (Paulocci et al., 1999). This is attributed to the fact that they understand their medical condition better and are also more likely to have been working prior to the stroke, and thus become anxious of the possibility of not being able to go back to work and their previous social life.

The abovementioned information brings one to the conclusion that the education status of a patient can have either a negative or positive effect on the functional outcome of patients after having a stroke. It shows that better knowledge/understanding, makes better educated patients more likely to change their health behaviour and to adhere to the treatment programme, as they would understand the consequences of non-compliance, while patients with better education are also likely to be depressed because of a better understanding of their condition. This depression in turn may affect functional outcome negatively.

2.4. INFLUENCE OF PHYSICAL FACTORS

2.4.1. Side of stroke and stroke sub type

Patients with right and left cerebrovascular accidents (CVA's) were found to have similar abilities when performing activities of daily living tasks and actions (Rexroth et al., 2005). A study by Bernspang and Fisher (1995), also established that patients with right and left cerebrovascular accident have hemispheric-specific differences in motor impairments, but do not differ significantly in domestic activities of daily living.

Patients with intra-cerebral haemorrhage (ICH) have greater functional impairment than cerebral infarction patients at admission; however, there is

no difference in the Functional Independence Measure on discharge (Kelly et al., 2003). This means that ICH patients with the most disabling strokes had significantly greater recovery than cerebral infarction patients with a stroke of similar severity. Paolucci et al. (2003) established that patients with (ICH) had more functional independence than ischaemic stroke patients on discharge from the hospital. A study by Sturm et al. (2004) established that there is no significant difference in handicap between ischaemic stroke (IS) and intra-cerebral haemorrhage in patients two years post stroke. It can thus be concluded that on admission, patients with ICH have less functional independence than patients with IS, but on discharge patients with ICH have more functional independence than those with IS. However two years post stroke there is no difference between the ICH and IS patients.

Kelly-Hayes et al. (2003) found that older age at stroke onset had a greater association with disability than stroke subtype. Age and severity of stroke, not stroke subtype, are independent predictors of placement in a nursing home after stroke Brown et al. (1999). Placement in a nursing home indicates the patient's inability to live independently at home.

Aprile et al. (2006) established that patients with a long duration of stroke are better at walking and have better tolerance of body pain. This study was done in an outpatient stroke unit, and thus was done on patients in the post acute stage. It thus indicates that walking and pain tolerance seem better with longer post stroke duration.

The side of a stroke was found to have no influence on the functional outcome. Having an ischaemic or a haemorrhagic stroke has also been found to make no significant difference to the functional outcome. Older age at stroke onset has been found to have more influence on functional outcome than the stroke subtype.

2.4.2. Presence of other diseases

Hypertension and diabetes were associated with the likelihood of having a disability post stroke (Pinsky et al., 1985). Kelly-Hayes et al. (2003) also

established that hypertension, diabetes, myocardial infarction and congestive heart failure were present before stroke onset in the population they studied. However Sturm et al. (2004)'s study established that functional independence was not dependent on the presence of other stroke risk factors. Depression, hip fracture, knee osteoarthritis and heart disease were found to contribute to more physical disability in a study by Guccione et al. (1994) on elderly patients. Thus elderly stroke patients are likely to have more physical disability if they have these “other” conditions in conjunction with a stroke.

Human Immune Deficiency (HIV) infection is also associated with stroke (Connor et al., 2004). “ Patients with HIV infection who do not have full blown AIDS or pulmonary infection have reduced work capacity, lower aerobic threshold, and poorer aerobic capacity than age matched controls” Johnston et al. (1990) in Mars (2004). Quality of life in the domain of mobility, usual activities, pain/discomfort and anxiety/depression was found to be compromised in people living with HIV, especially those in stages (World Health Organisation classification) 3 and 4 (Hughes et al., 2004). Thus the quality of life of patients who have HIV in conjunction with stroke is likely to be more compromised than in patients who have HIV only.

The literature on other diseases indicates that the presence of hypertension and diabetes is associated with the likelihood of having a stroke, but are not associated with functional independence post stroke. Depression, hip fracture, knee osteoarthritis, heart diseases and HIV/AIDS were however found to have a negative influence on functional ability in stroke patients.

2.4.3. Shoulder and leg pain

Hale and Eales (1998) found that one-third of the subjects who had a stroke experienced knee pain during walking. The same study also established that the main secondary stroke complications were pain, swelling of the feet and stiffness; whereas shoulder pain, and sometimes hand and elbow pain were frequent complaints.

The pain could be on the same side or the contra-lateral side as the stroke symptoms. In some instances it may be hard to determine whether the pain is

stroke related or not, but a study by Jonsson et al. (2005) showed that even though a patient may have pain before stroke onset, the pain intensity might change after stroke. The same study also found that the most common site of pain after stroke was the upper limb.

Jakobsson et al. (2003), who were investigating pain among older people, established that pain resulted in more functional limitations, fatique, sleeping problems, depressed mood, and that those in pain needed more help with activities of daily living than those without pain. These findings are similar to that of Jonsson et al. (2005), who also established that there is a correlation between functional status, depressed mood and pain among stroke patients. Jonsson et al. (2005)'s study also found that more than half of the stroke patients in their study had difficulty with their sleep because of pain.

There is agreement in all these studies that pain can have an influence on the patient’s functional ability.

2.4.4. Bladder and bowel symptoms

Daily incontinence may be managed with pads, regular toileting and structural management of incontinence in wards by professional nursing staff. However, after discharge, a stroke patient or carer may find this problem more difficult to manage and, therefore, this might affect the quality of their life (Brittain et al., 2000). The daily life consequences of urinary incontinence are widespread and may result in relationship problems for the person affected (Lam et al., 1992). Brittain et al. (2000)’s study in the Leicestershire community (UK) on community dwelling stroke survivors, indicate that between 1% and 5% of that population reported some restrictions in daily activities, which can be attributed to urinary incontinence.

Stroke patients with urinary incontinence are more likely to report an impact on their quality of life than people who have not had a stroke (Brittain et al., 2000). The impact on quality of life is not related to the stroke, but to the severity of the incontinence (Brittain et al., 2000). Stroke patients who remained or became continent had better functional outcome (Barer, (1989).

Recovery of continence promotes morale and self-esteem, which can actually speed up overall functional recovery.

2.5. INFLUENCE OF ENVIRONMENTAL FACTORS

2.5.1. Hospital length of stay and rehabilitation post discharge

Stroke patients with mild disabilities and supportive families can go directly home, and those with severe disabilities might receive better care in extended care facilities like stroke units (Mayo et al., 2000). This study also established that post discharge rehabilitation, especially home based rehabilitation, resulted in more functional recovery as it includes reintegration into the home and community. Greenberg et al. (2004) found that stroke patients complain mainly about decreased hand function, general functional deterioration and difficulty walking during follow-up examinations, and that 58% of these complaints were resolved through community rehabilitation services.

The length of hospital stay in South African private rehabilitation clinics was found to be 30 – 34 days by Green et al., (2005). The study also established that these patients were discharged with low functional status. This further confirms the need for post discharge rehabilitation. This study was however done on privately rehabilitated patients, which may not be a true reflection of the length of hospital stay for patients in a public hospital. The study by Hale and Eales (1998) was done in a public hospital, and established that the length of hospital stay post stroke was 12 days. It can be deduced that if those whose hospital stay was 30 – 34 days were less functional on discharge, then these patients with a 12 days hospital stay would be expected to be even less functional.

Kalra (1994), established that functional recovery is significantly higher and more rapid in a stroke rehabilitation unit compared with general wards despite similar therapy input. However patients who are admitted to a rehabilitation/stroke unit have a long hospital stay and thus more rehabilitation. Thus patients from a stroke unit are more likely to be

functionally independent when they get home, and thus would not be completely dependent on the caregiver for activities of daily living.

Although most stroke patients were able to walk, they felt the need for improved ability to walk, as they were afraid of falling (Hale et al., 1999). Thus the ability of the patient to walk safely must be ensured before discharge from a rehabilitation facility, to ensure that they don't avoid walking at home, and thus minimize their community participation.

The sooner the patient can be discharged home following a stroke, the sooner the community reintegration process can commence. However early discharge home is only beneficial if there is a support system, and an opportunity for continued rehabilitation to enhance functional independence.

2.5.2. Financial role and family income

The likelihood of achieving functional independence was found to be lower in patients who were unemployed before having a stroke (Stineman et al., 1997). The ability to achieve functional independence, in the previously employed group was attributed to the fact that they were more accustomed to the type of goal directed behaviour, which is necessary for the success of a rehabilitation programme.

Eales et al. (2004) found that patients who accepted self-responsibility for their recovery after coronary artery bypass and graft surgery had an annual income more than R50 000 and this was just 32% of the total patients in their study. The rest of the patients who were earning less than R50 000 annually, did not accept self responsibility for their recovery. It is thus important to establish the patient's household income.

Most stroke patients are not able to use the existing public transport system, and thus have to hire a car/taxi to fetch them from home, thus paying more than the general population for travelling to health and general community facilities (Hale et al., 1999). This increases the patient's financial difficulties. With increased financial difficulties, patients are unlikely to honour their

appointments for outpatient rehabilitation, and thus this might negatively influence their functional independence.

Employment prior to stroke and accessibility to transport has a positive influence to functional independence. Family income has no influence on functional independence.

2.5.3. Availability of caregiver

A study by Stineman et al. (1997), established that living alone before having a stroke was associated with the likelihood of improved partial functional independence post stroke. This is attributed to the fact that living alone before stroke may encourage the patient to achieve more functional independence because they know that they are unlikely to receive assistance after discharge from a hospital or stroke unit. Some caregivers react by overprotecting and over caring for the patient, in an attempt to alleviate feelings of guilt (Anderson et al., 1995). This caregiver behaviour contributes to further disability, as the patient is not given an opportunity to practice his or her own functional activities (Anderson et al., 1995).

The amount of social support a patient gets after having a stroke is positively associated with the extent of the functional status, thus even if a patient lives alone, they still need social support. Socially isolated stroke patients are at risk of poor functional status (Glass et al., 1993).

2.5.4. Community participation (Including availability of transport and accessibility of the home)

Stroke patients generally function better in activities of daily living than they do in social activities/interactions (Schmidt et al., 1986). However, stroke patients living with another adult demonstrated a lower degree of functioning in activities of daily living, but had better community participation (Schmidt et al., 1986). The adult carer will do most of the activities of daily living for the patient and thus not give them an opportunity to practice. Community participation will improve, because the adult carer is able to assist the patient with transfers and moving from one facility to another.

Accessibility of community facilities was found to be one of the predictors of social integration of stroke patients (Belanger et al., 1988). Thus, if the facilities were not accessible, it became less likely that the patient would integrate into the community. This also affects compliance with medication, as indicated by Hale et al. (1999), who established that medication non-compliance was largely due to financial and transportation difficulties in attending clinics.

2.5.5. Depression and emotional support

Depression is a frequent and important problem of patients who have had a stroke, as post stroke depression is present in at least 30% of stroke patients (Gainotti et al., 2001). The loss of usefulness and worth within the family unit and the need to go back to work are more depressing to patients than the lack of independence in activities of daily living (Hale et al., 1999). The development of post stroke depression is associated with poor performance in activities of daily living (Paulocci et al., 1999). Schwartz et al. (1993), established that depression is common in delayed stroke recovery, regardless of the lesion location. Van de Weg et al. (1999) also established that stroke patients with depression have significantly lower functional scores both at stroke onset and even after six months. Patients with post stroke depression have functioning that is worse than or comparable to that of patients with major chronic medical conditions (Herrmann et al., 1998)

2.6. REVIEW OF METHODOLOGY

The Barthel Index (BI) is an Activity of Daily Living (ADL) scale that was designed to quantify the amount of assistance needed to perform specific tasks required for independent living (Dromerick et al., 2003). The BI is easy to apply and has been well validated (Green et al., 2001 and Collin et al., 1988). The BI is also considered to be an observer-rated, multi-item, summing rating scale to evaluate disability in terms of dependency (Hobart et al., 2001). ADL scales should facilitate detection of smaller changes in disability and development of explicit scoring guidelines in which the correct answer can easily be determined (Dromerick et al., 2003).

The BI and Functional Independence Measure (FIM) are the most common measures of disability used in randomised controlled trials examining stroke rehabilitation. However, the BI is used more often than the FIM and is cited in trials of superior quality (Sangha et al., 2005).

The BI and FIM are recommended for group comparison studies and not for individual patient's decision making (Hobart et al., 2001). D'Olhaberriague et al. (1996) established that the interobserver agreement of the BI is greater than that of the Rankin score and that the BI was the most reliable disability scale. Non-medical personnel can use the BI reliably, as established by Schlote et al. (2004). Collin et al. (1988) also found no difference in the results of the BI when using four different methods of obtaining the score (i.e. self reporting, asking a trained nurse, and separate testing by two skilled observers). Carers tend to report lower patient abilities (Knapp and Hewison, 1999) and it is thus important to see the patient in order to have an idea about their functional ability, without having to rely solely on the caregiver's report.

Green et al. (2001) found that measurement of basic activities of daily living and mobility as measured by BI is reliable post stroke. "An assessment tool should be scientifically sound in terms of three basic psychometric properties: reliability, validity, and responsiveness" (Sharrack et al., 1999). The BI was found to meet all these requirements in a study by Hsueh et al. (2002).

The main requirements of scientific quality in data management are reliability, internal consistency and validity. Reliability includes inter-observer and intra-observer agreement (D'Olhaberriague et al. 1996). The size of the reliability coefficient is based on the average correlation among items and the number of items, and if coefficient alpha is low, either the test is too short or the items on the test have very little in common (Nunnaly, 1978). Green et al. (2001)'s study found the coefficient alpha of the BI to be 2.0 using Bland and Altman's (1986) techniques.

2.7. CONCLUSION

Information gained from this literature review indicates that among factors affecting functional independence post stroke, some have a positive and some a negative influence. Age seems to contribute more than gender in predicting functional independence post stroke. Spousal availability/absence has also been found to influence the patient's functional outcome. Literature about education status does not provide a conclusive answer about the influence of education on functional status. Some authors found it to have a negative influence and others found it to have a positive influence on functional independence.

The side of the stroke has no influence on the functional outcome. Having an ischaemic or a haemorrhagic stroke makes no significant difference to the functional outcome. The presence of hypertension and diabetes is associated with the likelihood of having a stroke, but not associated with functional independence post stroke. Depression, hip fracture, knee osteoarthritis, heart diseases and HIV/AIDS have an influence on functional ability. Post stroke there was agreement in all the studies found, that pain can have an influence on the patient's functional outcome. Recovery of continence promotes morale and self-esteem, which improves overall functional recovery.

It was generally found that the sooner the patient can be discharged home following a stroke, the sooner the community reintegration process can commence. However early discharge home is only beneficial if there is a support system, and an opportunity for continued rehabilitation. Employment prior to stroke, family income and accessibility to transport are regarded as having an influence on a patient's functional independence. The amount of social support a patient gets after having a stroke is associated with the functional status. Accessibility of community facilities is one of the predictors of social integration of stroke patients. Patients with post stroke depression have functioning that is worse than or comparable to that of patients with major chronic medical conditions.