# Relationship between Independency Level and Health Related Quality of Life for Ischemic Stroke Patients

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**Abstract:** Stroke is the leading cause of adult disability and the third leading cause of adult death in the world. An increase emphasis was held onpatient-centered outcomes such as functionalstatus and health-related quality of life. Little attention has been given to the quality of life and patients' independency level following expensive and often long term treatment. So, the present study was conducted to determine the relationship between independency level among ischemic stroke patients and health related quality of life.The study carried out in the physiotherapy departments of the Main University Hospital and Gamal Abdel Naser hospital in Alexandria Egypt. A convenient sample of 100 patients of both sexes was studied. Results revealed that there were a significant relationship between the patient's level of activity and the degree of independence. While, there was no significant correlation between the patient motoricity or level of independence and intellectual disturbance.

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**Keywords:** independency level, Health Related Quality of Life, ischemic stroke patients.

## 1. Introduction

Stroke is the third largest cause of death and an important cause of hospital admission and long term disability. It results from a disturbance of blood supply to a section of the brain and should not be considered as an isolated event but as a clinical consequence of a progressive underlying vascular disorder (1,2). The World Health Organization (1988) defines stroke as 'rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or leading to death, with no apparent cause other than vascular origin(3).

The impact of morbidity following stroke can be devastating for an individual. It has been reported that 50% of survivors have some significant disability due to loss or impairment of use of a limb, difficulties with speech or decline in intellectual function (1,4). Unfortunately, the definition of significant disability is open to question as its interpretation varies between studies. The most common deficit is motor impairment but not all strokes cause physical disabilities; about 16-25% of strokes have been reported to be non hemiplegic (5). Motor loss, visual and perceptual deficits, impairments of sensation and communication skills, and inability to swallow can be seen in isolation or any combination in patients following stroke. Characteristic patterns are widely reported but in clinical practice it is clear that the resulting deficits vary widely (4,6).

Stroke is an increasing global health issue that places considerable burden on society and health care services. Although the incidence of stroke is decreasing due to increased awareness and modification of risk factors such as hypertension and smoking, the absolute number of strokes continues to rise as a result of an ageing population and increased life expectancy (1, 7). Global stroke data shows that 15 million people suffer a stroke very year, 5 million people die annually from stroke and 5 million people are left with permanent disability as a result of stroke. Burden of disease is projected to rise from 38 million disability adjusted life years in 1990 to 61 million disability adjusted life years in 2020 (7).

In the United States, it is the third leading cause of death, after heart disease and cancer. There are approximately 600,000 ischemic strokes each year and up to one-third of these individuals remain permanently disabled. Globally, stroke is projected to be the fourth most common cause of premature death and disability by the year 2020(1,8).

Stroke is the leading cause of adult disability and the third leading cause of adult death in the world (9). Furthermore, it is a major, chronically disabling neurologic disease that often radically and permanently changes the lives of its victims (2,3). Ischemic stroke is the most common type of stroke affecting older adults. It accounts for 80 to 85 % of all strokes (1,2).

During recent years it has become increasingly evident that assessments of neurological function and disability are not sufficient to evaluate the whole impact of stroke on patients (10). To this end, it is vital to add measures of health-related quality of life (QOL) that do not only focus on stroke-related deficits or impairments, but also consider the fact that QOL is inherently an attribute of the patient's self-perception rather than a measure of various aspects of the health status(4).

Subjective well-being and health related quality of life (HRQoL) are patient-centered outcomes that are being increasingly incorporated in healthcare evaluation in the last decade. Quality of life has been defined as "individual's perceptions of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns" (11).

HRQoL is a related concept that refers to a diverse range of patient's perceptions and experiences of disease, which may be of central concern in terms of treatment goals (11). Stroke is the leading cause of long-term disability in western countries, and the length of time to recovery depends on stroke severity (9). Prevalence of stroke survivors who required care in at least one activity of daily living (ADL) has been estimated in 173/100 000. Neurologists are likely to see long-term stroke survivors who are living longer with stroke sequel due to the increase of their survival and the aging of population (2, 10).

In the social model of stroke, HRQoL is a complex interplay between stroke-related disability, environment, family and social support(11). Stroke patients commonly suffer from physical role alteration, mood disorders, cognitive impairment and decreased social interaction in the chronic phase of stroke(1-3). A complex network of factors that may influence individual's adjustment to life after stroke has been described. Age, gender (female), comorbidity (diabetes), disability, mood, coping styles and social support have been reported to be significant predictors of HRQoL in stroke survivors. In addition, the burden of the caregivers in the long-term management of stroke patients is substantial(8-11).

Standardized assessment of HRQoL in stroke survivors should be multidimensional, comprising at least several dimensions: physical (i.e., motor impairment, spasticity, ataxia, dysarthria, dysphagia, pain, sleep disturbances and fatigue), functional (mobility, care), mental (coping, mood, cognition) and social (work, social network), and requires a subjective rating by the patient(5). Nevertheless, results from some studies are conflicting because of the marked heterogeneity of the stroke population and the variability in HRQoL measures, including the use of non-standardized and generic HRQoL scales (11).

Approximately 30% of stroke patients die, and 30% remain disabled or unable to return to work. Approximately 30% only recover and regain independence in the activities of daily living (ADLs); however, they need lifelong drug treatment. Neurologic deficits and disabilities after recovery from the disease include hemiplegia, impaired body balance and ambulation, difficulty swallowing and speaking, impaired visual perception, and loss of bowel and bladder control(1,11).

Physical defects in stroke survivors can also cause psychological changes, such as aggression, impatience, stress, negativism, and depression. Depression is the most common psychological disorder reported in stroke survivors, with a prevalence ranging from 23% to 75%, and is considered the most powerless state and a significant cause of suicide in these survivors (12).

Assessment of quality of life (QoL) in patients poststroke has received increasing attention in stroke therapy (13). Stroke is a major health problem and one of the most expensive diseases in developed countries. Stroke results in both impairment, limitation in basic daily activities, and impacts on participation in community activities, such as returning to work (13,14). An assessment of QoLpoststroke would provide a more holistic picture of stroke recovery, especially because of the wide spectrum of symptoms and impairments associated with stroke (15).

The nursing role in stroke rehabilitation would appear to be fundamentally concerned with the provision of care which can be described as technical, managerial or therapeutic (16). There is a core of well-established technical activities that attempt to prevent further deterioration in the patient's condition and to maintain safety that appear to be done for a patient. These appear to infer the patient as a passive recipient of care and rehabilitation, and tend to be rule, or policy driven. Nursing also appears to have a patient management function which primarily facilitates the co-ordination of therapy and services(17).

There would also appear to be a range of nursing activities that support the development of psychosocial coping strategies that help patients deal with the aftermath of stroke. As a process rather than an outcome, therapeutic nursing focuses on education and emotional support, and requires an active partnership between the patient and nurse in stroke care(16). Although knowledge of the therapeutic nature of stroke rehabilitation nursing is emerging, there is an urgent need to expand understanding of the relative merits of therapeutic nursing within the profession and beyond (16,17).

The importance of building a model of therapeutic nursing has been recognized (17). The literature includes practice-driven, inclusive models which define therapeutic nursing as care that enhances quality of life. The danger of this broad approach is that it may be argued the majority of nursing interventions indirectly aim to improve quality of life (16, 17).

Health-related quality of life (HRQOL) is defined by the Food and Drug administration (2007) as: “A multi-domain concept that represents the patient’s overall perception of the impact of an illness and its treatment. A HRQOL measure captures, at a minimum, physical, psychological (including emotional and cognitive), and social functioning (18). Four fundamental dimensions are essential to any HRQOL measure. These include physical, mental/ psychological, and social health, as well as global perceptions of function and well-being (11,18).

Because of the stroke consequences, an increase emphasis was held onpatient-centered outcomes such as functionalstatus and health-related quality of life (1, 4). However, little attention has been given to the quality of life and patients' independency level following expensive and often long term treatment. Furthermore, HRQoL outcomes have been used in few stroke trials. So, this study aims to determine the relationship between dependency level among ischemic stroke patients and health related quality of life.

## 2.Material And Methods

### Materials:

**Design:**

A descriptive (retrospective) research design.

**Settings:**

The study was carried out at the outpatient physiotherapy departments of the main university and GamalAbd El Nasser hospital.

**Subjects:**

The study subjects comprised all conscious patients of both sexes with cerebral stroke admitted to the physiotherapy department after one month from their diagnosis with cerebral vascular stroke and fulfilling the following criteria:

- Diagnosed with cerebral stoke.
- Able to communicate.
- Accept to participate in the study.

The sturdy subjects were 100 patients.

**Tools:**

In order to collect the necessary information for the study three tools were used.

**Tool: (1): (An interview schedule sheet)**

This sheet was developed by the researcher and included the following information:

**Part (1):**

Social – demographic characteristics of the study sample such as age, sex, level of education, marital status, occupation after injury, social & economic status and living arrangement.

**Part (II):**

Health status of the patient, duration of illness, present history (risk factors) as hypertension, diabetes mellitus, heart disease, a trial fibrillation, hypercoagulability, hyperlipidemia, obesity, physical inactivity and transient ischemic attack.

Family history of cerebral vascular stroke.

Risk behaviors such as smoking and its duration, caffeine consumption and its daily amount.

Functional and emotional health pattern, respiratory status, cardiovascular status, activity, exercise, communication, body image, urinary, neurological and self esteem.

**Part (III):**

Included items regarding functional abilities as performing simple activities which includes 16 items focused on bathing, dressing, eating, shopping and performing social activities, 12 items for emotional and psychological wellbeing, 5 items for social and sexual relations and 19 items about life satisfaction level.

**Tool two:**

**Barthel's activity for daily living index (BADLI)** which included items regarding to feeding, bathing. grooming, bowels, bladder, toilet use, mobility and transfer.

**Tool three: (observational checklist)**

**Part I:**

- Included items related to patient motoricity index as elbow flexion, shoulder abduction, ankle dorsi flexion, knee extension and hip flexion.

**Part II:**

- Included assessment of secondary problems as type of sensation.
- **Superficial sensation:**which focused on 3 items (tactile, temperature, pain)
- **Deep sensation:** included items related to position sense, joint sense, movement sense. Pressure sense and vibration sense.

**Part III:**

Included items related to assessment of intellectual disturbance as orientation, registration, attention and calculation, recall and language.

### Methods:

1. Permission to carry out the study was obtained from the administrative, personnel of the chosen setting after explanation of the aim of the study.
2. Tool (I) and (II) were translated into Arabic by the researcher and tested for its content validity by a jury of 5 experts in the related medical and nursing staff and the necessary modifications were done accordingly.
3. Tool II was tested for its reliability by test-retest method.

4. Verbal consent of the subjects was obtained after explanation of the purpose of the study.
5. A pilot study was carried out on 5 patients to assess the clarity and applicability of the tools used and the necessary modifications were done.
6. Each participant was interviewed individually after explaining of the purpose of the study then the necessary data were collected.
7. Privacy of the subjects was assured and confidentiality of the collected data was maintained.
8. Based on the schedule of the outpatient physiotherapy departments of the main university hospital and Gamal Abd El Nasser hospital the researcher visited each department three days a week.
9. Patient's health record was reviewed to identify the patients fulfilling the study criteria.
10. A number of 1-5 subjects were interviewed per day, each interview lasted for 30-45 minutes, depending on the response of the interviewee.
11. The data collection covered a period of four months.

## 3.Results

**Table (1):** shows the sociodemographic characteristics of the patients.

It was found that 64% of the patients were male at the age range from 38 to 84 with a mean of 55.69 ± 16.10.

In relation to social status, most of patients 78% were married. As regards to the level of education the results revealed that 33% were illiterate 44% of the patients have enough family income. Regarding to the duration of illness it ranged from 1 to 6 months with a mean 10 ± 11.32.

Also, this results revealed that 88% of patients were hypertensive, 69% were diabetic and 36% had a trial fibrillations.

Moreover, this table showed that 77% of patients on acetylsalicytic acid (aspirin).

**Table (2):** presents the distribution of the studied patients according to establishing degree of independence.

This table revealed that 78% of patients moderate assistance while 22% of patients were maximal dependence.

**Table (3):** reveals the distribution of the studied patients according to the assessment of secondary problems.

The results revealed that 96% of patient had pain during movement of injured extremities, 87% had-pressure sense and 89% of patients had vibration sense.

**Table (4):** presents the distribution of the studied cases according the patient motoricity index scale.

This table showed that 44% of patients were mild paralysis, 32% moderate paralysis and 24% were severely paralysis.

**Table (5):** shows the distribution of studied patient's according to minimental state examination for intellectual disturbance.

It was found that 76% of patients were normal while 11% were mild dementia and 10% were moderate dementia.

**Table (6):** shows correlation between patient motoricity index scale, establishing degree of midependence and patient's minimental state examination for intellectual disturbance (MMSE).

The results revealed statistically significant relationship between degree of independence and patient motoricity index scale.

Moreover, this table revealed a statistically significant relationship between patient motoricityindex an patient's minimental state examination for intellectual disturbance.

**Table (7):** presents the relationship between establishing degree of independence with patient motoricity index scale and patient's minimental state examination

It was found that about half of the patients (47.4%) had mild paralysis and need moderate assistance while 14.1% of patients had severe paralysis with maximal dependence on others. Also, there were a statistically significant relationship between patient motoricity index scale and the establishing degree of independence.

**Table (8):** shows the relationship between patient motoricity index scale and patient's minimental state examination for intellectual disturbance (MMSE).

The results revealed no relationship between patient motoricity index scale and minimental state examination for intellectual disturbance.

**Table (9):** shows relationship between establishing degree of independence with motoricity index scale and patient's minimental state examination for intellectual disturbance (MMSE).

**Tables (1): Distribution of studied cases according to socio-demographic data**

| | No | % |
|---|---|---|
| **Sex** | | |
| Male | 64 | 64.0 |
| Female | 36 | 36.0 |
| **Age** | | |
| Range | 38.0 – 84.0 | |
| Mean ± SD | 55.69 ± 10.10 | |
| **Residence** | | |
| Rural | 20 | 20.0 |
| Urban | 80 | 80.0 |
| **Social status** | | |
| Single | 6 | 6.0 |
| Married | 78 | 78.0 |
| Divorced | 3 | 3.0 |
| Widow | 13 | 13.0 |
| **Level of education** | | |
| Illiterate | 33 | 33.0 |
| Primary | 23 | 23.0 |
| Preparatory | 11 | 11.0 |
| Secondary | 12 | 12.0 |
| University | 21 | 21.0 |
| **Occupation after injury** | | |
| Administrative work | 8 | 8.0 |
| Manual work | 14 | 14.0 |
| Not worker | 25 | 25.0 |
| House wife | 24 | 24.0 |
| Others | 29 | 29.0 |
| **Socioeconomic status: Number of individuals in the family** | | |
| 1-2 | 21 | 21.0 |
| 1 – 4 | 40 | 40.0 |
| 5 – 6 | 28 | 28.0 |
| More | 11 | 11.0 |
| **Socioeconomic status:Number of rooms in the house** | | |
| One room | 11 | 11.0 |
| Two room | 32 | 32.0 |
| Three room | 57 | 57.0 |
| More than three | 0 | 0.0 |
| **Family income** | | |
| Less than enough | 40 | 40.0 |
| Enough | 44 | 44.0 |
| Enough and more | 10 | 10.0 |
| Enough and save money | 6 | 6.0 |
| **Duration of illness (months)** | | |
| Range | 1.0 – 72.0 | |
| Mean ± SD | 10.18 ± 11.32 | |
| **Present history ( Risk factors)** | | |
| Diabetes mellitus. | 69 | 69.0 |
| Heart disease' atria fibrillation | 36 | 36.0 |
| Heavy alcohol consumption | 3 | 3.0 |
| Hypercoagulability | 4 | 4.0 |
| Hyperlipidemia | 16 | 16.0 |
| Hypertension | 88 | 88.0 |
| Obesity | 24 | 24.0 |
| Use of oral contraceptives | 7 | 7.0 |
| Physical inactivity | 3 | 3.0 |
| Sickle cell anemia | 1 | 1.0 |
| Smoking | 37 | 37.0 |
| **Medications** | | |
| Thrombolytic drugs (recombinant tissue plasminogen activator TPA) | 41 | 41.0 |
| Warfarin | 33 | 33.0 |
| Anticoagulant and platelet inhibitors. | 63 | 63.0 |
| Acetylsalicylic acid( aspirin) | 77 | 77.0 |

**Tables (2): Distribution of studied cases according to establishing degree of independence**

| | No | % |
|---|---|---|
| **Establishing degree of independence** | | |
| Fully independent | 0 | 0.0 |
| No or minimal assistance | 0 | 0.0 |
| Moderate assistance | 78 | 78.0 |
| Maximal dependence | 22 | 22.0 |

**Tables (3): Distribution of studied cases according to assessment of secondary problems**

| | **No** | | **Yes** | |
|---|---|---|---|---|
| | **No** | **%** | **No** | **%** |
| **A- Superficial sensation** | | | | |
| a. Tactile | 45 | 45.0 | 55 | 55.0 |
| b. Temperature | 23 | 23.0 | 77 | 77.0 |
| c. Pain | 4 | 4.0 | 96 | 96.0 |
| **B. deep sensation** | | | | |
| a. Position sense | | | | |
| i. Joint sense | 27 | 27.0 | 73 | 73.0 |
| ii. Movement sense | 23 | 23.0 | 77 | 77.0 |
| b. Pressure sense | 13 | 13.0 | 87 | 87.0 |
| c. Vibration sense | 11 | 11.0 | 89 | 89.0 |

**Tables (4): Distribution of studied cases according to patient motoricity index scale**

| | No | % |
|---|---|---|
| **Patient motoricity index scale** | | |
| Normal | 0 | 0.0 |
| Mild paralysis | 44 | 44.0 |
| Moderate paralysis | 32 | 32.0 |
| Severe paralysis | 24 | 24.0 |

**Tables (5): Distribution of studied cases according to patient's minimental state examination for intellectual disturbance (MMSE)**

| | No | % |
|---|---|---|
| **MMSE** | | |
| Normal | 76 | 76.0 |
| Mild dementia | 11 | 11.0 |
| Moderate dementia | 10 | 10.0 |
| Severe dementia | 3 | 3.0 |

**Tables (6): Correlation between patient motoricity index scale, establishing degree of independence and patient's minimental state examination for intellectual disturbance (MMSE)**

| | | **Patient motoricity index scale** | **MMSE** |
|---|---|---|---|
| **Establishing degree of independence** | $r_s$ | $0.285^*$ | 0.136 |
| | $p$ | 0.004 | 0.176 |
| **Patient motoricity index scale** | $r_s$ | | $0.245^*$ |
| | $p$ | | 0.014 |

$r_s$: Spearman coefficient

*: Statistically significant at $p \leq 0.05$

**Tables (7):Relation between establishing degree of independence with patient motoricity index scale and patient's minimental state examination for intellectual disturbance (MMSE)**

| | **Establishing degree of independence** | | | | **Test of sig.** |
|---|---|---|---|---|---|
| | **Moderate assistance (n =78)** | | **Maximal dependence (n=22)** | | |
| | **No.** | **%** | **No.** | **%** | |
| **Patient motoricity index scale** | | | | | $p < 0.001^*$ |
| Normal | 0 | 0.0 | 0 | 0.0 | |
| Mild paralysis | 37 | 47.4 | 7 | 31.8 | |
| Moderate paralysis | 30 | 38.5 | 2 | 9.1 | |
| Severe paralysis | 11 | 14.1 | 13 | 59.1 | |
| **MMSE** | | | | | MCp = 0.179 |
| Normal | 62 | 79.5 | 14 | 63.3 | |
| Mild dementia | 6 | 7.7 | 5 | 22.7 | |
| Moderate dementia | 8 | 10.3 | 2 | 9.1 | |
| Severe dementia | 2 | 2.6 | 1 | 4.5 | |

$p$: $p$ value for Chi-square test

MCp: $p$ value for Monte Carlo test

*: Statistically significant at $p \leq 0.05$

**Tables (8):Relation between patient motoricity index scale and patient's minimental state examination for intellectual disturbance (MMSE)**

| | Patient motoricity index scale | | | | | | MCp |
|---|---|---|---|---|---|---|---|
| | Mild paralysis | | Moderate paralysis | | Severe paralysis | | |
| | No. | % | No. | % | No. | % | |
| **MMSE** | | | | | | | |
| Normal | 38 | 86.4 | 23 | 71.9 | 15 | 62.5 | 0.162 |
| Mild dementia | 4 | 9.1 | 4 | 12.5 | 3 | 12.5 | |
| Moderate dementia | 2 | 4.5 | 3 | 9.4 | 5 | 20.8 | |
| Severe dementia | 0 | 0.0 | 2 | 6.3 | 1 | 4.2 | |

MCp: *p* value for Monte Carlo test

**Tables (9):Relation between establishing degree of independence with patient motoricity index scale and patient's minimental state examination for intellectual disturbance (MMSE)**

| | Establishing degree of independence | | | | Test of sig. |
|---|---|---|---|---|---|
| | Moderate assistance (n = 78) | | Maximal dependence (n = 22) | | |
| | No. | % | No. | % | |
| **Sex** | | | | | |
| Male | 48 | 61.5 | 16 | 72.7 | *p* = 0.334 |
| Female | 30 | 38.5 | 6 | 27.3 | |
| **Age** | | | | | |
| 30 - <40 years | 3 | 3.8 | 2 | 9.1 | MCp = 0.248 |
| 40 - < 60 years | 51 | 65.4 | 11 | 50.0 | |
| ≥ 60 years | 24 | 30.8 | 9 | 40.9 | |
| Range | 38.0 – 84.0 | | 38.0 – 78.0 | | $^{t}p = 0.263$ |
| Mean ± SD | 55.05 ± 9.62 | | 57.95 ± 11.62 | | |
| **Level of education** | | | | | |
| Illiterate | 25 | 32.1 | 8 | 36.4 | *p* = 0.483 |
| Primary | 16 | 20.5 | 7 | 31.8 | |
| Preparatory | 10 | 12.8 | 1 | 4.5 | |
| Secondary | 11 | 14.1 | 1 | 4.5 | |
| University | 16 | 20.5 | 5 | 22.7 | |
| **Occupation after injury** | | | | | |
| Administrative work | 6 | 7.7 | 2 | 9.1 | MCp = 0.709 |
| Manual work | 11 | 14.1 | 3 | 13.6 | |
| Not worker | 17 | 21.8 | 8 | 36.4 | |
| House wife | 20 | 25.6 | 4 | 18.2 | |
| Others | 24 | 30.8 | 5 | 22.7 | |
| **Family income** | | | | | |
| Less than enough | 29 | 37.2 | 11 | 50.0 | MCp = 0.536 |
| Enough | 36 | 46.2 | 8 | 36.4 | |
| Enough and more | 9 | 11.5 | 1 | 4.5 | |
| Enough and save money | 4 | 5.1 | 2 | 9.1 | |
| **Duration of illness** | | | | | |
| 1 - <6 months | 35 | 44.9 | 5 | 22.7 | MCp= 0.037* |
| 6 months - <1 year | 25 | 32.1 | 6 | 27.3 | |
| 1 - < years | 15 | 19.2 | 7 | 31.8 | |
| ≥ 3 years | 3 | 3.8 | 4 | 18.2 | |
| Range | 1.0 – 48.0 | | 1.50 – 72.0 | | *p* = 0.033* |
| Mean ± SD | 8.35 ± 8.62 | | 16.66 ± 16.60 | | |

*p*: *p* value for Chi-square test

$^{t}$p:p value for Student t-test

MCp: *p* value for Monte Carlo test

*: Statistically significant at $p \leq 0.05$

## 4. Discussion

Because of the stroke consequences, an increase emphasis was held onpatient-centered outcomes such as functionalstatus and health-related quality of life (3, 4). However, little attention has been given to quality of life and patients' independency level following expensive and often long term treatment. So, the present study was conducted to determine relationship between dependency level among ischemic stroke patients and health related quality of life.

The results of the present study revealed that the mean age of the studied subjects is 55 years old. Stroke is often considered a disease of older adults, the incidence of stroke increases greatly with age, with its rate doubling every 10 years after the age of 55 in both men and women (19).

The present study revealed that cerebral stroke was encountered more among males than females. This may be due to some of the risk factors such as smoking and stress which were observed more among male elders(20).

Hypertension and diabetes are among the major risk factors leading to cerebral stroke(21). The results of the present study revealed that 88% of patients had hypertension, 69 % had diabetes mellitus. This finding supports the results of other studies carried out in USA 2002 (22), and Australia 2008 (23).

Diabetes mellitus is a well – established independent risk factor for stroke and is associated with high mortality. This increased risk has been linked to the pathophysiological changes seen in the cerebral vessels of patients with diabetes (24).

The present study indicated that none of the study subjects (0.0 %) was fully independent and 22 % needed maximal dependence. In this respect, Langhorne et al study revealedthat 30-60% of stroke survivors are dependent insome aspects of activities of daily living(25).

Regarding motor function assessment, 44 % of the studied subjects had mild paralysis. In this respect, Hendricks *et al.*(26) emphasized that the most common and widely recognized impairment caused by stroke is motor impairment, which can be regarded as a loss or limitation of function in muscle control or movement or a limitation in mobility. Moreover, motor impairment after stroke typically affects the control of movement of the face, arm, and leg of one side of the body and affects about 80% of patients.

The results of the present study indicates that statistically significant relationship between degree of independence and patient motoricity index scale . In agreement with previous studies ,Langhorne*et al.*(25) study revealed that There seems to be a direct relation between motor impairment and function; for example, independence in walking (function) has been correlated with lower-limb strength (impairment). Therefore, the ultimate goal of therapy for lower-limb motor impairment is to improve the function of walking and recovery of movement.

Motor impairment can be caused by ischaemic or haemorrhagic injury to the motor cortex, premotor cortex, motor tracts, or associated pathways in the cerebrum or cerebellum. Such impairments affect an individual’s ability to complete everyday activities (disability) and affect participation in everyday life situations (25, 26).

The limitations of our study that our study focus should consider post stroke complications for stroke patients as Previous authors have noted the strong association between post stroke complications and poor outcome and have suggested that complications may act as barriers to recovery. This raises the possibility that rigorous attention to detail in the prevention and early treatment of complications could improve stroke outcome. Indeed, many studies indicated that the causes of death that are most likely to be prevented. post stroke complications are immobility complications (in particular, thromboembolism and infection). In more prolonged follow-up, it is clear that this group of patients has significant morbidity and risk of readmission to hospital. Interventions to detect and treat the more common complications appear worthy of further study(27).

## Conclusion

Results of the present study concluded that there were a significant relationship between the patient’s level of activity and the degree of independence while there was no significant correlation between the patient motoricity or level of independence and intellectual disturbance.

## Recommendations

1- Every effort should be provided toward maintenance of physical, intellectual and social activity of the patient.
2- Raise awareness of the patient about the importance of regular physiotherapy to improve self care abilities, increase independence and provide sense of accomplishment.
3- Emphasize the importance of periodic medical examination on follow up.
4- Counseling should be provided for all stroke patients regarding how to make physical exercise and the importance of independence on others on activity of daily life.
5- Improve the physiotherapy units and increase to the number of device to provide a chance for each patient to make the exercise.
6- Establishment of patient-education and rehabilitation unit and it should be provided to the patient from the admission.

7- A colored booklet and posters should be available in each physiotherapy and rehabilitation unit about the importance of exercise.
8- Written policies and guidelines should be available regarding application of physiotherapy and use of different types of machines and devices.
9- Development of in-service training program for all nurses working in any unit with stroke patients about their role in providing a comprehensive explanation and skills needed for patients regarding all phases of rehabilitation.

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