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Quality Of Life among Rehabilitated Stroke survivors in Gaza Strip

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بسم الله الرحمن الرحيم

{ لَا يُكَلِّفُ اللَّهُ نَفْسًا إِلَّا وُسْعَهَا لَهَا مَا كَسَبَتْ وَعَلَيْهَا مَا
اكْتَسَبَتْ رَبَّنَا لَا تُؤَاخِذْنَا إِنْ نَسِينَا أَوْ أَخْطَأْنَا رَبَّنَا وَلَا تَحْمِلْ
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وَلَا تُحَمِّلْنَا مَا لَا طَاقَةَ لَنَا بِهِ وَاعْفُ عَنَّا وَاغْفِرْ لَنَا وَارْحَمْنَا
أَنْتَ مَوْلَانَا فَانْصُرْنَا عَلَى الْقَوْمِ الْكَافِرِينَ }

(سورة البقرة ٢٨٦)

صدق الله العظيم

بسم الله الرحمن الرحيم

Dedication

I would like to dedicate my work with deep love

To my parents

My wife

My family

My colleagues and to the real friends

For their ever constant endless love and support.

Fuad M. Luzon

In the name of Allah, the Beneficent, the Merciful

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The abstract

The background and the purpose: The purposes of this study was to examine the quality of life and to identify most common factors influencing the quality of life in long-term rehabilitated stroke survivors in Gaza Strip.

The methods: The study depend on cross-sectional design. It included 90 rehabilitated stroke survivors, 32 of them are males, and 58 of them are females who were admitted to El-Wafa rehabilitation hospital in the period between 1-1-2000 to 31-12-2006. The researcher used non-probability convenience sampling. The data was collected at the patient's homes in Gaza strip.

The Quality of life was measured by Short Form-36 (SF-36) instrument that assesses satisfaction and the importance for eight domains (general health, physical functioning, mental health, role limitation due to physical health, role limitation due to emotional problems, body pain, vitality, and social functioning). The tool included also the functional independent measure (FIM) to measure patient's functional status.

The researcher used SPSS for statistical analysis, frequency tables for all study variables, correlation between variables, T-test to identify different mean relationship, one way ANOVA, and cross tabulation using Chi-Square.

The results: The study shows that the stroke survivors had good QOL with 55.6%. The mental health was the best QOL domain (81.28%), followed by general health (77.77%), body pain (76.24%), vitality (71.6%) almost similar with social functioning (71.39%). The poorer QOL domain was role limitation due to physical health (28.05%), followed by physical function (40.89%), and role limitation due to emotional problems (42.97%)

The results shows that the males had poorer QOL than of them the female 32% compared with 62%. QOL were better at the age between 50-60 years (48%) compared with the age between 61-65 (32%), and the younger (43-50 years) participants (20%). Stroke survivors who lives in Gaza city had better QOL (60%) than stroke survivors who lives outside Gaza city (40%). And only level of education was statistically significant in different with QOL (p=0.038), The

results shows that 16 of secondary school educated stroke survivors had best QOL (32.0%), followed by 12 of university educated stroke survivors (24.0%) , 9 of preparatory school (18.0%), 7 of non educated stroke survivors (14.0%), and at last 6 of primary school educated stroke survivors (12.0%). One way ANOVA test between means revealed that there were significant means differences between primary school and secondary school education (P=0.044).

Concerning the health factors that may influence QOL, results shows that all comorbid factors affect QOL with no statistically significant differences between them and QOL among rehabilitated stroke survivors

Related to effect of functional status on QOL, the results shows the mean of FIM scores on admission to the rehabilitation hospital =59.88, on discharge from the hospital at the end of inpatient rehabilitation program =85.6, and at the follow-up which was performed by the researcher to collect data =95.23. And the correlation between QOL and functional status positive statistical significant value on admission to the rehabilitation hospital (0.023), on discharge from the hospital at the end of inpatient rehabilitation program (0.001), and at the follow-up which was performed by the researcher to collect data (0.000). That's indicating effectiveness of the rehabilitation program conducted in El-Wafa rehabilitation hospital to improve the functional status and the outcome among this category of disability, and with related other psychosocial factors. This results certain by the higher percent of the stroke survivors who were independent at follow-up with better QOL (80.0%) than of then moderately dependent (20.0%).

Age and level of education significantly affect physical function, and role limitation due physical health. Only severity of motor deficit significantly affect role limitation due physical health, and social functioning, also level of education and place of residency significantly affect vitality, mental health, and general health

ملخص الدراسة

أهداف الدراسة: تهدف هذه الدراسة لتحديد جودة الحياة لمصابي الجلطة الدماغية، و تحديد العوامل التي من الممكن أن يكون لها تأثير على جودة الحياة لهذه الفئة من المرضى في قطاع غزة، وهذا يخدم العاملين في مجال التأهيل و الصحة النفسية المجتمعية للعمل على تحسين و تطوير الخطط العلاجية الهادفة إلى تقليل اعتمادية الفرد في تأدية أنشطة الحياة اليومية بهدف تحسين جودة الحياة، و إعتماد نظام متابعة فعال بعد الانتهاء من فترة التأهيل الطبي للحد من المشاكل التي يواجهها مثل تلك الفئة من المرضى في المجتمع.

الأدوات المستخدمة: استخدم الباحث مقياسين أحدهما لقياس جودة الحياة (SF-36) و الذي شمل ثمان حقول (الصحة العامة، الوظائف الجسدية، الصحة النفسية، القيد في الدور بسبب الصحة الجسدية، القيد في الدور بسبب المشاكل العاطفية، الألم الجسدي، الحيوية و النشاط، القدرات أو المهام الاجتماعية) و المقياس الآخر لقياس الأداء الوظيفي في أنشطة الحياة اليومية (FIM).

الإجراءات: عينة الدراسة شملت على ٩٠ مشارك (٥٨ من الإناث و ٣٢ من الذكور) و الذين تلقوا خدمة التأهيل في مستشفى الوفاء للتأهيل من الفترة الزمنية بين ١-١-٢٠٠٠ إلى ٣١-١٢-٢٠٠٦ موزعين في جميع أنحاء قطاع غزة. و قد تم اخذ المعلومات من خلال تعبئة الاستبيان في منازل هؤلاء المشاركين، و قد تم اختيار هذه العينة بطريقة العينة الغير احتمالية- عينة الصدفة

التحليل الإحصائي: تم استخدام البرنامج الإحصائي SPSS في تحليل البيانات، مستخدما الإحصاءات الوصفية و الجداول التكرارية، تحليل الارتباط، و مقارنة المتوسطات عن طريق اختبارT للفرق بين متوسطي عينتين، و تحليل التباين لمعيار واحد. و جداول التقاطع مع استخدام مربع كآي وذلك للمقارنة بين مجموعات ومتغيرات مختلفة في الدراسة.

النتائج: الدراسة أوضحت بأن جودة الحياة لدى مصابي الجلطة الدماغية تشكل حوالي بنسبة ٥٥.٦%، و من حيث المكونات كانت الصحة النفسية الأفضل بنسبة ٨١.٢٨%، تليها الصحة العامة بنسبة ٧٧.٧٧%، الألم الجسدي بنسبة ٧٦.٢٤%، الحيوية و النشاط بنسبة ٧١.٦%، و مماثلة لها تقريبا القدرات أو الوظائف الاجتماعية بنسبة ٧١.٣٩%. و كان الأدنى و الأفقر هو القيد في الدور بسبب الصحة الجسدية بنسبة ٢٨.٠٥%، و من ثم الصحة الجسدية بنسبة ٤٠.٨٩%، و القيد في الدور بسبب المشاكل العاطفية بنسبة ٤٢.٩٧%.

كما أوضحت الدراسة بأن جودة الحياة عند الذكور أقل منها عند الإناث بنسبة ٦٢% مقارنة مع ٣٨%، و كانت الأفضل عند الفئة العمرية المتوسطة ٥٠-٦٠ سنة بنسبة ٤٨% تليها الفئة العمرية ٦١-٦٥ سنة بنسبة ٣٢% من هؤلاء الذين كانت أعمارهم من ٤٣-٥٠ سنة و ذلك بنسبة ٢٠% فقط. وأظهر تحليل الارتباط بين جودة الحياة و العمر علاقة عكسية لها دلالة إحصائية (p=0.038) مما يعني كلما زاد التقدم في العمر قلت جودة الحياة. و قد تبين أن الأشخاص الذين يقيمون في مدينة غزة لديهم جودة حياة أفضل (٦٠%) من الأشخاص الذين يقيمون خارجها (٤٠%). و قد أوضحت الدراسة بدلالة إحصائية عالية و مضطردة (p=0.009) علاقة المستوى التعليمي و تأثيره على جودة الحياة بحيث وجد أن الأشخاص الذين تلقوا التعليم الثانوي لديهم جودة حياة أفضل (٣٢%)، يليهم الأشخاص حاملين الشهادات الجامعية (٢٤%)، و الأشخاص الذين تلقوا التعليم الإعدادي (١٨%) ، و الأشخاص الغير متعلمين من هذه الفئة (١٤%) ، و كان أقلهم الأشخاص الذين تلقوا التعليم الابتدائي (١٢%). و أظهر تحليل التباين لمعيار واحد وجود علاقة بين متوسطي التعليم الابتدائي و التعليم الثانوي مثبت بدلالة إحصائية (p=0.044).

بما يتعلق بمدى تأثير العوامل الصحية بجودة الحياة، أوضحت النتائج تأثير الأمراض المزمنة، و شدة الإعاقة الحركية و الإعاقات الأخرى المصاحبة للجلطة الدماغية مثل الحبسة الكلامية بأن لها تأثير سلبي على جودة الحياة، و لكن بدون دلالات إحصائية.

إما فيما يتعلق في تأثير استقلالية الشخص في أنشطة الحياة اليومية على جودة الحياة، أظهرت نتائج مقارنة متوسط مجموع نقاط مقياس استقلالية الوظائف عند الدخول إلى مستشفى التأهيل (٥٩.٨٨)، و عند الخروج من المستشفى و عند انتهاء برنامج التأهيل (٨٥.٦)، و المتابعة التي قام بها الباحث في وقت جمع المعلومات (٩٥.٢٣) أظهر تحسن ملحوظ على أداء المشاركين الوظيفي، مما يدل على فعالية برنامج التأهيل في مستشفى الوفاء للتأهيل لمثل تلك الفئة من المعاقين، و بالإضافة إلى العوامل النفسية المجتمعية الأخرى. كما أظهر تحليل الارتباط بين جودة الحياة و مقياس استقلالية الوظائف علاقة ايجابية لها دلالة إحصائية عند الدخول إلى مستشفى التأهيل (p=0.023) ، و عند الخروج من المستشفى و انتهاء برنامج التأهيل (p=0.001) ، و المتابعة التي قام بها الباحث في وقت جمع المعلومات (p=0.000) ، ما يدل على تأثير الاستقلال الوظيفي على جودة الحياة. وبدلالة أن أغلب المشاركين

الذين كانوا مستقلين في أدائهم لأنشطة الحياة اليومية وقت جمع المعلومات كانت لديهم نسبة عالية من جودة الحياة (٨٠%) مقارنة مع المشاركين الذين كانوا مستقلين بشكل متوسط (٢٠%).

كما و أظهرت النتائج و بدلالات إحصائية أن العمر و المستوى التعليمي لهما تأثير على الصحة الجسدية و القيد في الدور بسبب الصحة الجسدية، و حدة الإعاقة الحركية لها تأثير على القيد في الدور بسبب الصحة الجسدية و القدرات أو الوظائف الاجتماعية. المستوى التعليمي و مكان الإقامة لهما التأثير على الحيوية و النشاط، الصحة النفسية، و الصحة العامة

`The contents

The content of tables

List of abbreviations

1.	UNRWA	United Nations Relief and Works Agency
2.	PNA	Palestinian National Authority
3.	MOH	Ministry of Health
4.	NGOs	Non Governmental Organizations
5.	HRQL	Health-related quality of life
6.	SS-QOL	Stroke-specific quality of life measure scales
7.	SAQOL	Aphasia Quality of Life Scale
8.	MOS-36	Multidimensional health Status measure (Medical Outcome Study)
9.	NIH	National institute of health Stroke Scale
10.	QOL	Quality Of Life
11.	SF-36	Short Form-36
12.	FIM	Functional Independent Measure
13.	CT	Computed Tomography
14.	MRI	Magnetic Resonance Imaging
15.	SAH	Subarachnoid hemorrhage
16.	AVM	Arteriovenous malformation
17.	TIA	Transient Ischemic Attach
18.	CRPS	Complex Regional Pain Syndrome
19.	ADL	Activity of Daily Living

List of appendixes

CHAPTER ONE

THE STUDY PLAN

1.1. Introduction

"Being able to develop or maintain high quality of life (QOL) after a disability is one of the most important outcomes of rehabilitation". Low or decreased QOL may also occur, especially when people return to the community. Furthermore, as people with disability, many experience changes in their health and functional activities which challenge their QOL.

Stroke is a condition of high incidence and with high mortality rates, leaving a large proportion of survivors with significant residual physical, cognitive, and psychological impairments (Gresham, 1990). The increasing number of older adults and the emergence of new therapies for acute stroke suggest there will be an increase in the number of stroke survivors living with disabilities. Furthermore, globally trends in stroke severity report a decrease of most severely affected (Wolf , 1992).

Stroke rehabilitation is an active process begins during acute hospitalization, progressing for those with residual impairments to a systematic program of rehabilitation services, and continuing after the individual returns to the community. It is an organized effort to help stroke patients maximize all opportunities for returning back to an active and productive lifestyle. Because the clinical manifestations of stroke are multifaceted and complex, stroke rehabilitation is best implemented through the coordinated efforts of the team of rehabilitation professionals. Rehabilitation of stroke patients involves six major criteria's : (1) preventing, recognizing, managing comorbid illness and medical complications; (2) training for maximum independence; (3) facilitating maximum psychosocial coping and adaptation by patient and family; (4) preventing secondary disability by promoting community reintegration, including resumption of home, family, recreational, and vocational activities; (5) enhancing quality of life in view of residual disability; (6) preventing recurrent stroke and other vascular conditions such as myocardial infarction that occur with increased frequency in patients with stroke (Roth, 1992).

In the United States, stroke is the third leading cause of death among adults, and the most common cause of disability (Cuccurullo 2004, Samsa 1999). Age is the most single important risk factor for stroke worldwide; after age 55, incidence increases for males and females. Risk more than doubles each decade after age 55 males more than females (Cuccurullo, 2004).

According to the Palestinian Ministry Of Health (MOH), annual report 2004 stated that cerebrovascular diseases are the fourth leading cause of death in general population (8.3%) at age below 60 years, the sixth in males (6.7%) and the third in females (10.5%), and the second (in people) above 60 years with a prevalence of (13.9%). It represented the fourth leading cause of death of total

cardiovascular mortality (24.4%), with a rate of 23.4 per 100,000. The mortality rate per (100,000) among females is more than the males (24.1 male Vs 25.4 female). The recent annual report 2006, cerebrovascular disease was one of highest-leading causes of death in general population (11%), with rate (29.8 per 100,000 of population), the third in males (9.9%) and the second in females (12.4%). It represented the third leading cause of death of total cardiovascular mortality (29.5%), with a rate of 29.8 per 100,000

Numerous studies had documented that the majority of stroke survivors have decrease in QOL (Hackett 2000, Williams 1999, Duncan 1997) and this appears to be true even for individuals who have minor strokes (Williams 1999, Williams 1999, Duncan 1997).

Several factors have been identified to decrease QOL among stroke survivors. Increased age (Hackett 2000, Niemi 1988, Haan 1995), the severity of motor impairment or paralysis (Jonkman 1998, Niemi 1988, De Haan 1993), lack of perceived social supports (Viitanen 1988, King 1996), inability to return to work (Niemi 1988, Viitanen 1988), impaired cognition (Kwa 1996), the presence of comorbid health problems (De Haan 1995, Kwa 1996), and supratentorial lesion locations (Sneeuw 1997, De Haan 1995). All the previously mentioned factors have been correlated with a decreased QOL and should be considered when analyzing the stroke outcomes.

The measurement of QOL typically encompasses physical, functional, psychological, cognitive, and social aspects of life and generally reflects an individual's subjective perception of his/her current function and overall health. Since patient perceptions are key elements in the current health care environment where patient centered care is emphasized, documenting self reported quality of life should be an integral component of post-stroke assessment and intervention.

1.2. Demography and population:

1.2.1 Palestine History:

Palestine was known as the land of Canaan in ancient history, when Abraham migrated to the land of Canaan it was a well-developed country. The philistines entered the land of Canaan from Crete about 1250 B.C. and settled in the coastal areas. They were the people who gave Palestine its name, and the land of Canaan since roman times has been known as Palestine. Nowadays Palestinians Arabs, are Muslims and Christians. They are the descendants of all the races and nations which have lived in and conquered Palestine from the times of the Canaanites to the British occupation of Palestine in 1916. Under the ottoman Turks government in 1914 , Palestine's population was composed of 634,000 Muslim and Christian Arabs and 55,000 Jews who had immigrated from Europe, mainly from Russia. Immediately after the publication of the Belfour declaration in 1917, clashes took place between Jews and Arabs in Palestine. In 1967, Israel launched a war of aggression against Egypt, Jordan and Syria and occupied the west bank, Gaza the Golan Heights and Sinai Peninsula.

Palestine stretches from Ras Al-Nakora in the north to Ellat in the south. The entire area of Palestine is about 27,000 sq.km, including Tabariya, El-Hoola lakes and half of the area of Dead Sea. Now, Palestine comprises two areas separated geographically: the west bank and Gaza strip.

The total area is 6,020 sq.km. With total population living in 3,762,005 individuals in 2005 with capita per sq. km. 625.

1.2.2. Gaza strip:

Gaza strip (GS) is a narrow piece of land lying on the lower part of the eastern coast of the Mediterranean sea. Its position on the crossroads from Africa to Asia made it as essential target for occupiers and conquerors over the centuries. The last of these was Israel who occupied the GS and toke it from administrative of Egyptian supervision in 1967. GS is very crowded place with area 365 sq.km and constitute 6.1% of total area of Palestinian territory land. In year of 2005 the population number is to be 1.389.789 mainly concentrated in the cities, small villages, and the eight refugee camps that contain two thirds of the population of Gaza strip. In Gaza strip, the population density is 3,808 inhabitants/km2 and it comprises the following main five governorates.

North of Gaza constituted 17% of the total area of Gaza strip and 1.0% of total area of Palestinian territory area with area 61 sq.km. . The total number of

population living in north Gaza is to be 265,932 individuals in 2005 with capita per sq km 4,360.

Gaza city constituted 20.3% of the total areas of Gaza strip and 1.2% of total area of Palestinian territory area with area 74 sq. Km. The total number of population living in Gaza City is 487,904 individuals in 2005 with capita sq Km 6,593.

Mid-Zone constituted about 15% of the total area of Gaza strip and 1.0% of total area of Palestinian territory area with area 58 sq. Km. The total number of population living in Mid-Zone is 201,112 individuals in 2005 with capita per sq Km 3,467.

Khan-younis constituted about 30.5% of the total area of Gaza strip and 1.8% of total area of Palestinian territory area with area 108 sq. Km. The total number of population in Khanyounis is 269,601 individuals in 2005 with capita per sq Km 2,496.

Rafah constituted about 16.2% the total area of Gaza strip and 1.1% of total area of Palestinian territory area with area 64 sq. Km. The total number of population in Rafah is 165,240 individuals in 2005 with capita per sq Km 2,582.

1.2.3. The Palestinian population in the Palestinian Territories

The population number in Palestine is estimated at 3.7 million in mid year 2005. Out of total number 2.3 million in west Bank and 1.3 million in Gaza strip with percentage (63%) and (37%) respectively. According to the distribution of the population by Governorates, Al-khaleil Governorate has the highest rate of population at 13.9% of the total population, followed by Gaza Governorate 13%; AL-Quds Governorate comes third with 10.6% on the other hand, Jericho Governorate has the lowest rate of population at the mid year of 2005 at 1.1%.

1.2.4. Palestinian economy

The World Bank stated that the Gross National product (GNP) in Palestine has been subjected to high fluctuations during the last five years. Gross National production (GNP) was 5,454 million US$ in 1999 and decreased to 4,169 million US$ in 2005. Gross Domestic Production (GDP) was 4,517 million US$ in 1999 and decreased to 3,832 million US$ in 2005. Gross Notional production per capita (GNP/capita) was 1,806 US$ in 1999 and decreased to 1,039 US$ in 2005. Gross Domestic production per capita (GDP/capita) was 1,496 US$ in 1999 and decreased to 955 US$ in 2005.

The number of workers in Israel decreased from 135,000 in 1999 to 36.000 in 2005. The workers in Palestine also decreased from 453.000 in 1999 to 135.000 in 2005. The World Bank reported that the unemployment rate was 32%. This revealed sharply increasing of unemployment rate from sharply increasing of unemployment rate from 11.8% in 1999 to 32% and the poverty rate in Palestine was 44% in 2005. This situation is a result of Israeli enforced restriction on Palestinian movement, military operations, land confiscation and leveling and the construction of Barrier in addition to other escalating activities on Palestinian people.

1.3. Palestinian health care system:

1.3.1. Primary health care (PHC)

PHC centers: Primary health care system (PHC) is a major component of Palestinian health care system; this system has provided health care to all Palestinian people especially for children and other venerable groups. Primary health care centers in Palestine provide primary and secondary health care services as well as tertiary services. In the last five years and after the uprising of second intifada (Al Aqua), PHC centers in Palestine have been developed in a dynamic way to face the instability of Palestinian situation were Israeli occupied forces tends to divide Palestinian localities into isolated geographical areas. PHC centers try to offer accessible and affordable health services for all Palestinians regardless the geographical locations. According to MOH policy, PHC centers classified from level 1 to level 2. They offer different health services according to clinic level, these services include maternal and child health, care of chronic diseases, daily care, family planning, dental, mental services and other services according to center level .

1.3.2. Primary health care providers in Palestine:

The MOH are working with other health sectors in providing the primary health services mainly with UNRWA, and NGOs sector. At the end of 2005, there are 654 PHC centers in Palestine; these centers are caring for about 3.7 million people (129 centers in Gaza and 525 centers in West Bank). Classification of PHC according to providers shows that, the MOH is considered the main provider with 63.6% from the total PHC centers, followed by the NGOs with 28.3%, then UNRWA with 8.1%. It is worth to mention that, Private sector plays an important role in providing PHC services to Palestinian people but, there is limited information about these centers. The average ratio of persons per center was 5.752(10.774 in Gaza Strip and 4.519 in West Bank). The Number of PHC centers per 10.000 persons was 1.7 in 2005 while it was 1.9 in 2000 (Ministry of Health, 2006).

1.3.2.1. Medical Services for police (MSP) Services:

In Palestine, MSP provides preventive and curative services to Palestinian people through a network of PHC centers, medical points and medical units, by the end of 2005, there are 13 PHC centers (5 in the west bank and 8 in Gaza strip , also there are 18 medical units (11 in the west bank and 7 in Gaza strip) and 21 medical point (16 in Gaza strip and 5 in the west bank) they provide medical services for policemen general security persons and their families in addition to the general population.

1.3.2.2. Hospitals

The MOH is responsible for a significant portion of the secondary healthcare delivery system (60-70% of general and specialized hospital beds) and more than this proportion in hospital services (about 70% of hospital services). In 2005, there are 43 general hospitals with 3,726 beds, 10 specialized hospitals with a total bed capacity of 812 beds, 19 maternity hospitals at a total bed capacity of 322 beds and four rehabilitation centers with a total bed capacity of 165 beds (51 in Gaza Strip, 99 in West Bank, and 5 in Jerusalem), and all of the rehabilitation hospitals are owned and operated by the NGOs. Rehabilitation hospitals provided services for 2,132 inpatients through 49,800 hospitalization days. The average bed occupancy rate at the four rehabilitation NGOs hospitals in Palestine was 86.9%. The average length of stay was 23.4 days.

EL - Wafa hospital is the first recognized inpatient rehabilitation hospital in Gaza Strip, established in 1996 to offer medical rehabilitation services for cases recovering from post acute and chronic physical and cognitive disabilities caused by head and spinal cord injuries, fractures, strokes and other conditions through in and outpatient departments. The rehabilitation team includes rehabilitation doctors, nurses, physiotherapists, occupational therapists, speech therapists and communication therapy specialist, and psychologist.

The hospitals' inpatient department has a capacity of 50 beds designated for different wards, including male, female, children, and a special care unit.

Incurring a disability has devastating and long lasting effects on a person. Clients, who have experienced illness or injury of any origin, may recover physically after being managed medically but if there is a disability, there will be a need for continues care and extensive rehabilitation programs to bring them back to optimal levels of independence. The hospital uses a holistic approach that sees the patient from all aspects of their problems and life situation. The hospitals'

interdisciplinary team creates shared goals and develops an individualized plan of care for each client.

Following the client's discharge there is a notification system, which allows professionals at the community based rehabilitation program to further supervise the cases in the community and provide us with feed back regarding any new problem occurring to the client for the proper intervention. On discharge, the client receives a full and comprehensive report containing recommendations such as home medication, frequency of periodic laboratory examinations and medical check ups, home adaptations, assistive devices and the follow up program of physiotherapy at home if needed. Furthermore the hospital provides assistive devices and medical aids to less privileged clients who would otherwise be unable to afford them.

In addition to patient care services the hospital take part in medical rehabilitation education and training of students from different Palestinian universities and colleges such as Islamic University, Al Azhar University and the UNRWA physiotherapy program.

1.4. Research hypothesis

There is no relationship between Quality of life and rehabilitated stroke survivors in Gaza Strip

1.5. Research questions

1. What is the level of QOL rehabilitated stroke survivors in Gaza strip?

2. Which are most common factors influencing QOL among rehabilitated stroke survivors in Gaza Strip?

1.6. Objectives of the study

1.6.1. General Objectives

- To determine level of QOL among rehabilitated stroke survivors in Gaza strip. And to identify the most common factors influencing QOL among rehabilitated stroke survivors in Gaza Strip.

1.6.2. Specific Objectives

- To evaluate the level of QOL after stroke.

- To investigate the relationship between QOL and functional status among rehabilitated stroke survivors.

- To determine the prevalence of risk factors influencing QOL among rehabilitated stroke survivors in Gaza Strip.

- To measure QOL as rehabilitation outcome

1.7. Significance of the study

- Stroke may affect multiple dimensions of QOL and related outcome, knowledge concerning its clinical, functional and cognitive correlates is limited. Moreover, little attention has been paid to the sociodemographic aspects of domain-specific QOL after stroke.

- Although much is known about the long-term outcome of stroke patients in terms of mortality and disability, there has been no evidence that any research have been conducted in Gaza Strip to evaluate QOL after impact of disease as stroke, and to measure QOL as rehabilitation outcome.

- Using standardize outcome measure as short form 36 (SF-36) Arabic-version and Functional Independent Measure (FIM) will help health professionals to evaluate QOL and functional status among stroke survivors , to define factors that influence QOL among stroke survivors, and to find out Follow-up system based on outcome measure using well known SF-36 and FIM.

CHAPTER TWO

THE THEORICAL BACKGROUND

2.1. Definition of stroke

Stroke or cerebrovascular accident (CVA) is sudden focal/global neurological deficit (characterized by loss of motor control, altered sensation, cognitive or language impairment, disequilibrium, or coma) secondary to occlusion or rupture of blood vessels supplying oxygen and nutrition to the brain tissue, with persistence of symptoms beyond 24 hours (Cuccurullo 2004). Stroke symptoms that resolve completely within 24 hours defined as transient ischemic attack (TIA) (Cuccurullo 2004).

2.2. Epidemiology of stroke

Stroke remains the third leading cause of death, behind heart disease and cancer. Stroke is the leading cause of serious, long-term disability in the United States. In 1999, about 1,100,000 Americans reported difficulties with daily living because of a stroke. Each year, about 700,000 people suffer a stroke. About 500,000 of these are first attacks, and 200,000 are recurrent attacks (AHA Heart and Stroke Statistical Update, 2007).

Stroke killed 275,000 people in 2002 and accounted for about 1 out of 16 deaths in the United States. Within a year, up to 25% of people who have had a transient ischemic attack (TIA or "mini-stroke") will die. This percentage is high among people 65 and older (AHA Heart and Stroke Statistical Update, 2007).

2.3. Risk factors (Stewart, 1999)

2.3.1. Non-modifiable risk factors:

- **Age:** age is the most important risk factor for stroke worldwide; after age 55, the risk is more than doubles for each decade after age 55, incidence increases for both males and females.
- **Gender:** stroke affects men and women about equally, but women are more likely to die of stroke than are men.
- **Family history:** risk of stroke is slightly greater if there is a family history of stroke or TIA.

2.3.2. Modifiable (treatable) risk factors:

- **High blood pressure:** high blood pressure (hypertension) probably the most important modifiable risk factor for both ischemic and hemorrhagic stroke. It can weaken and damage blood vessels in and around the brain, leaving them vulnerable to atherosclerosis and hemorrhage.
- **Previous stroke or TIA:** ~ 5% of patients with TIA will develop a completed stroke within 1 month if untreated
- **Cardiovascular diseases:** several cardiovascular diseases can increase risk of a stroke, including congestive heart failure (CHF), a previous heart attack, an infection of a heart valve (endocarditis), a particular type of abnormal heart rhythm (atrial fibrillation), aortic or mitral valve disease, valve replacement, or a hole in the upper chambers of the heart known as patent foramen ovale. Atrial fibrillation is the most common condition associated with strokes caused by embolic clots. In addition, atherosclerosis in blood vessels near the heart may indicate atherosclerosis in other blood vessels (including those in and around the brain).
- **Diabetes mellitus:** diabetes is a major risk factor for stroke. When having diabetes, body not only can't handle glucose appropriately, but it also can't process fats efficiently, and the person at greater risk of high blood pressure. These diabetes-related effects increase risk of developing atherosclerosis. Diabetes also interferes with body's ability to break down blood clots, increasing risk of ischemic stroke; unfortunately, good blood sugar control has not been shown to alter the risk of stroke.
- **Smoking:** smokers have a much higher risk of stroke than do nonsmokers. Smoking contributes to plaques in the arteries. Nicotine makes heart work harder by increasing heart rate and blood pressure. The carbon monoxide in cigarette smoke replaces oxygen in the blood, decreasing the amount of oxygen delivered to the walls of the arteries and tissues, including the tissues in the brain.
- **Carotid stenosis:** risk of stroke decreases with carotid endarterectomy (CEA) on selected symptomatic patients (> 70% stenosis).
- **Contraceptives:** Use of birth control pills and hormone therapy. The risk of stroke is higher among women who take birth control pills, especially among smokers and those older than 35.
- **Cancer**
- **Cholesterol:** a blood fat, also may increase risk of atherosclerosis. In contrast, high levels of high-density lipoprotein (HDL) cholesterol, the "good" cholesterol, reduce risk of atherosclerosis by escorting cholesterol out of body through liver. High levels of low-density lipoprotein (LDL) cholesterol, the "bad" cholesterol, may increase risk of atherosclerosis. In

excess, LDLs and other materials build up on the lining of artery walls, where they may harden into plaques.

- **Weight:** being overweight increases chance of developing high blood pressure, heart disease, atherosclerosis and diabetes (all of which increase risk of a stroke).
- **Others:** other factors that can increase risk of stroke include heavy or binge drinking, the use of illicit drugs such as cocaine, and uncontrolled stress.

2.4. Types of stroke

Stroke is basically divided into two main categories, ischemic and hemorrhage stroke

2.4.1. Ischemic stroke

About 80 percent of strokes are ischemic strokes. They occur when blood clots or other particles block arteries to the brain and cause severely reduced blood flow (ischemia). This deprives the brain cells of oxygen and nutrients, and cells may begin to die within minutes. The most common ischemic strokes are:

2.4.1.1. Thrombotic (large artery thrombosis): 35% of all strokes

This type of stroke occurs when a blood clot (thrombus) forms in one of the arteries that supply blood to the brain. A clot usually forms in areas damaged by atherosclerosis. Usually occurs during sleep (patient often awakens unaware of deficits), with intermittent progression of neurological deficits or be slowly progressive (over 24–48 hours), the neurological deficit varies according to cerebral territory affected. Profound loss of consciousness rare, except when area of infarction is large or when brainstem involved. Perfusion failure distal to site of severe stenosis or occlusion of major vessels. (Cuccurullo 2004)

2.4.1.2. Embolic: 30% of all strokes

An embolic stroke occurs when a blood clot (embolus) or other particle forms in a blood vessel away from the brain (commonly in heart) and is swept through the bloodstream to lodge in narrower brain arteries. Usually occurs during waking hours, with immediate progression of neurological deficit. Seizures may occur at onset of stroke, and cortical signs more frequent.

Chronic atrial fibrillation is the most common cause. Seen with myocardial infarction, cardiac aneurysm, cardiomyopathy, atrial myxoma, valvular heart disease (rheumatic, bacterial endocarditis, calcific aortic stenosis, mitral valve prolapse), sick sinus syndrome. And 75% of cardiogenic emboli go to brain. (Cuccurullo 2004)

2.4.1.3. Lacunar infarction: 20% of all strokes

Lacunes are small (less than 15 mm) infarcts seen in the putamen, pons, thalamus, caudate, and internal capsule. Lacunar infarction cased due to occlusive arteriolar or small artery disease (occlusion of deep penetrating branches of large vessels), this occlusion occurs in small arteries of 50—200 μm in diameter, and it is with strong correlation with hypertension (up to 81%); also associated with micro-atheroma, microembolism or rarely arteritis.

Onset may be abrupt or gradual; up to 30% develop slowly over or up to 36 hours. CT shows lesion in about 2/3 of cases (MRI may be more sensitive). Syndromes are relatively pure often (motor, sensory), and absence of higher cortical function involvement (language, praxis, non-dominant hemisphere syndrome, vision). (Cuccurullo 2004)

2.4.1.4. Neuroanatomical location of ischemic stroke (Adams, 1997)

1. **Anterior circulation**

Which include Internal Carotid Artery (ICA); Middle Cerebral Artery (MCA), and Anterior Cerebral Artery (ACA)

2. **Posterior circulation:**

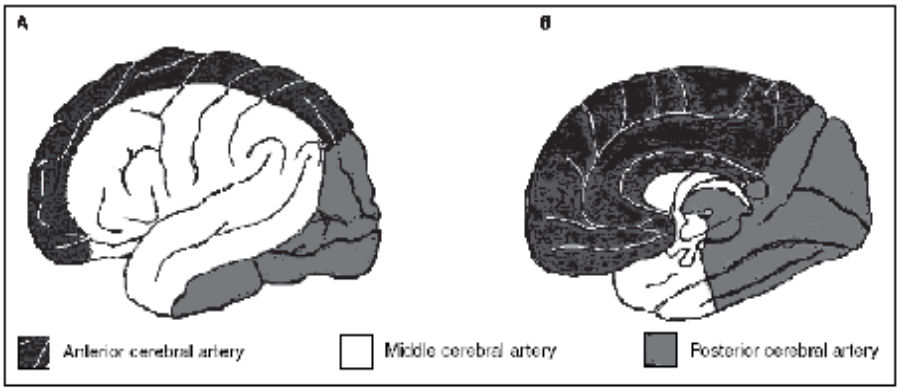
Which include Vertebrobasilar Arteries & Posterior Cerebral Arteries

Figure 2–1: The three cerebral arteries' cortical territories they supply. **A.** Lateral aspect of the hemisphere. **B.** Medial and inferior aspects of the hemisphere.

1. Most of the lateral aspect of the hemisphere is mainly supplied by the middle cerebral artery.

2. The anterior cerebral artery supplies the medial aspect of the hemisphere from the lamina terminalis to the cuneus.

3. The posterior cerebral artery supplies the posterior inferior surface of the temporal lobe and thevisual cortex.



2.4.2. Hemorrhagic strokes

Hemorrhagic stroke represent 15% of all strokes, occurs when a blood vessel in the brain leaks or ruptures. Hemorrhages can result from a number of conditions that affect blood vessels, including uncontrolled high blood pressure (hypertension) and weak spots in blood vessel walls (aneurysms). A less common cause of hemorrhage is the rupture of an arteriovenous malformation (AVM), blood dyscrasias/bleeding disorders, anticoagulants, bleeding into tumors, angiopathies.

There are two types of hemorrhagic stroke:

2.4.2.1. Intracerebral hemorrhage

Bleeding occurs from a broken blood vessel within the brain. Major risk factor is high blood pressure (hypertension), symptoms develops as sudden onset of headache, and/or loss of consciousness. Vomiting at onset in 22%–44%. Seizures occur in 10% of cases (first few days after onset), and nuchal rigidity is common (Cuccurullo 2004). The most common sites are the basal ganglia (putamen, thalamus, and adjacent deep white matter), deep cerebellum, and pons.

Large hemorrhage causes; stupor/coma , and hemiplegia with deterioration in hours. While smaller hemorrhages causes headache leading to aphasia, hemiplegia, eyes deviate away from paretic limbs. Aphasia present with lesions of the dominant side, dysarthria, dysphagia also occur. These symptoms, occurring over few minutes to one-half hour, are strongly suggestive of progressive intracerebral bleeding.

2.4.2.2. **Subarachnoid hemorrhage (SAH)** (Ruptured Saccular Arterial Aneurysm)

In this type of stroke, bleeding starts in a large artery on or near the membrane surrounding the brain and spills into the space between the surface of the brain and skull. A subarachnoid hemorrhage is often signaled by a sudden, severe "thunderclap" headache. This type of stroke is commonly caused by the rupture of an aneurysm, which can develop with age or result from a genetic predisposition. After a subarachnoid hemorrhage, vessels may go into vasospasm, a condition in which arteries near the hemorrhage constrict erratically, causing brain cell damage by further restricting or blocking blood flow to portions of the brain.

90%–95% of saccular aneurysms occur on the anterior part of the circle of Willis. Presumed to result from congenital medial and elastica defects vs hemodynamic forces causing focal destruction of internal elastic membrane at bifurcations. (Adams, 1997).

Rupture occurs usually when patient is active rather than during sleep (e.g., straining, coitus), with age between fifth and sixth decade.

Symptoms due to aneurysms; presentation can be either: None, usually asymptomatic prior to rupture (intracranial aneurysms are common, found during 3%–5% of routine autopsies). With subarachnoid hemorrhage, blood is irritating to the dura causing severe headache, with sudden, transient loss of consciousness in 20%–45% at onset (mortality rate 25% during first 24 hours), hemiparesis, aphasia (dominant hemisphere), memory loss, seizures can occur at 4% of patients at onset/25% overall. The most common complication is vasospasm occurring in ~ 25% of cases; caused by the presence of blood breakdown products (vasoactive amines) on the subarachnoid space, acting in the adventitia of the arteries. Occurs 3–12 days after rupture (Cuccurullo 2004).

2.4.2.3. Vascular malformation/Avms

Consists of a tangle of dilated vessels that form an abnormal communication between the arterial and venous systems: an arteriovenous (AV) fistula, as a caused of congenital lesions originating early in fetal life. (Brown 1996) .

Table 2-1: Comparison between the two types of stroke

	Ischemic 85%			**Hemorrhagic 15%**	
Type	Thrombosis	Embolic	Lacunar	Intracerebral hemorrhage	Subarachnoid hemorrhage
Frequency (%)	35	30	20	10	5
Factors associated with onset	Occurs during sleep	Occurs while awake		In 90% of cases occurs when the patient is calm and unstressed Blacks > whites	Occurs during activity (often strenuous activity)
Major causes/etiology	Perfusion failure distal to site of severe stenosis or occlusion of major vessels	Due mainly to cardiac source	Small lesions seen mainly: putamen pons thalamus caudate internal capsule/corona radiata	Hypertension	From ruptured aneurysms and vascular malformations
Presentation	Slowly (gradually) progressive deficit	Sudden, immediate deficit (seizures may occur)	Abrupt or gradual onset	Gradual onset (over minutes to days) or sudden onset of local neurologic deficits	Sudden onset
Link with TIA	50% with preceding TIA (50% occurring same vascular territory of preceding TIA)	TIA less common than in thrombotic 11% with preceding TIA	23% with preceding TIA	8% with preceding TIA	7% with preceding TIA

2.5. Diagnosis of stroke

Patient history and the physical examination provide information pointing out to stroke as the possible cause of the symptoms. However, the acute onset of focal neurological symptoms must suggest a vascular disorder at any age, even without associated risk factors. Lab evaluation includes blood analyses and image studies (computer-aided tomography of the brain or nuclear magnetic resonance) (Table 2-2). Other tests: ultrasound exam of carotid arteries and vertebrae, echocardiography and angiography can be performed.

Table 2-2: Diagnostic studies

	Infarct	**Hemorrhage**
CT	Focally decreases density (hypodense) = darker than normal **Black** Not seen immediately (unless there is a mass effect) May be seen after 24 hrs. (due to increase in edema); seen best within 3 to 4 days	Blood Hyperdense (radio-opaque) **White** Seen immediately
MRI	Edema Fluid: high density **White** Can be seen immediately as bright area on T2	Blood Low signal density **Black** (on either T1 or T2)

2.6. Medical stroke management

2.6.1. Principal goals

Stroke requires good general patient care. All phases include caring for the conditions the patient may have and preventing medical complications and anticipating needs that will arise as the patient progresses through the acute phase into the convalescent, rehabilitative, and long-term maintenance phases after stroke. Care of acute patients is provided best in a specialized stroke unit the commonly deals with the issues and concerns unique to these patients (Harold 2005).

2.6.2. Acute stroke management (Ferri, 1998; Rosen, 1992; Stewart, 1999)

Airway obstruction can occur with paralysis of throat, tongue, or mouth muscles and pooling of saliva. Stroke patients with recurrent seizures are at increased risk of airway obstruction. Aspiration of vomiting is a concern in hemorrhagic strokes (increased association of vomiting at onset). Breathing abnormalities (central) occasionally seen in patients with severe strokes. Impaired level of consciousness/coma. If there is acute deterioration of level of consciousness, evaluate for hematoma/acute hydrocephalus; treatment: emergency surgery.

Because the clinical picture of hemorrhagic and ischemic stroke may overlap, CT scan without contrast is needed in most cases to definitively differentiate between the two.

Management of blood pressure after acute ischemic and hemorrhagic stroke is controversial. Many patients have HTN after ischemic or hemorrhagic strokes but few require emergency treatment. Elevations in blood pressure usually resolve without antihypertensive medications during the first few days after stroke. (Biller 1997)

2.6.2.1. Ischemic stroke

The patients who have had ischemic strokes, the restoration of blood flow and the control of neural damage at the area of ischemia are the highest priority. In large strokes, edema can play a significant role, and mass shift can even lead to hydrocephalus. The pharmacologic therapies are divided broadly into

antithrombotic (aspirin and heparin), thrombolytic (urokinase, streptokinase, and tissue plasminogen activator), neuroprotective (calcium channel blockers, naloxone, gangliosides, glutamate antagonists, and free-radical scavengers), and antiedema therapies (coricosteroids, mannitol, glycerol, vinca alkaloids, and piracetam). The surgical therapies include endarterectomy, extracranial-intracrenial bypass, and balloon angioplasty (Cuccurullo 2004).

2.6.2.2. Hemorrhagic stroke

In patients who have had a hemorrhagic stroke, the size and location of the lesion determines the overall prognosis; supratentorial lesions more than 5 cm have a poor prognoses, and brainstem lesions of 3 cm are usually fatal. In these cases the control of edema is important, and the techniques described for surgical intervention can be used. In patients with SAH, the treatment regimen is usually more aggressive and focuses on several issues, which include the control of intracranial pressure, prevention of rebleeding, maintenance of cerebral perfusion, and control of vasospasm (Gillen 2004).

2.7. Care and rehabilitation

The primary goal of stroke rehabilitation is functional enhancement by maximizing the independence, quality of life, and self esteem of the patient. Stroke rehabilitation is the process by which patients with disabling strokes undergo treatment to help them return to normal life as much as possible by regaining and relearning the skills of everyday living. It also aims to help the survivor understand and adapt to difficulties, prevent secondary complications and educate family members to play a supporting role.

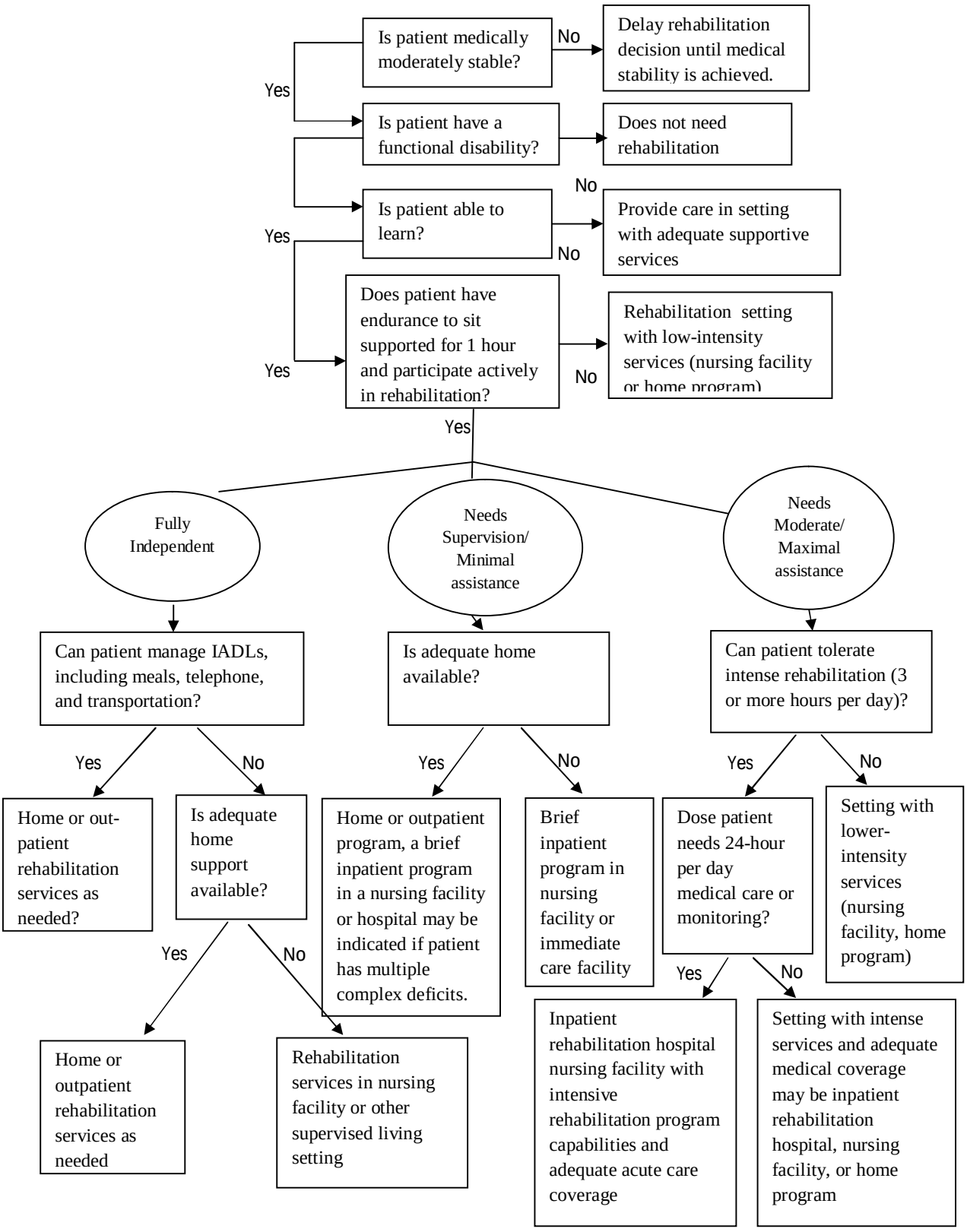
Stroke rehabilitation is an active process beginning during acute hospitalization, progressing for those with residual impairments to a systematic program of rehabilitation services, and continuing after the individual returns to the community. It is an organized effort to help stroke patients maximize all opportunities for returning to an active and productive lifestyle. Because the clinical manifestations of stroke are multifaceted and complex, stroke rehabilitation is best implemented through the coordinated efforts of a team of rehabilitation professionals.

A well-conceived rehabilitation management plan is the basis for all rehabilitation. The first step is to match the patient with the appropriate rehabilitation services and setting (Figure 2-2). Reasonable medical stability, significant functional disability, and the ability to learn are the primary criteria for rehabilitation. Patients with severe cognitive deficits resulting in the inability to

learn new strategies are unlikely to benefit from rehabilitation. A minimal level of physical endurance is also essential.

Choice of rehabilitation setting for a patient meeting threshold criteria depends on the level of assistance needed to perform daily activities, the closeness of medical supervision required, and the ability to tolerate intense therapy. A patient requiring at least moderate assistance and who can tolerate activities requiring several hours of intense physical and mental effort each day has the potential to recover function more rapidly if referred to an intense (acute) rehabilitation program in a hospital or nursing facility. Patients unable to tolerate intense treatment, even if they need moderate to maximum assistance, will be better served in a lower level program in a nursing facility or at home (Gresham 1997).

Figure 2-2: Rehabilitation Management Plan



A rehabilitation team is usually multidisciplinary as it involves staff with different skills working together to help the patient. These include nursing staff, physiotherapy, occupational therapy, speech and language therapy, and usually a physician trained in rehabilitation medicine. Some teams may also include psychologists, social workers, and pharmacists since at least one third of the patients manifest post stroke depression.

Good nursing care is fundamental in maintaining skin care, feeding, hydration, positioning, and monitoring vital signs such as temperature, pulse, and blood pressure. Stroke rehabilitation begins almost immediately.

For most stroke patients, physical therapy (PT) and occupational therapy (OT) are the cornerstones of the rehabilitation process. Often, assistive technology such as a wheelchair, walkers, canes, and orthosis may be beneficial. PT and OT have overlapping areas of working but their main attention fields are; PT involves re-learning functions as transferring, walking and other gross motor functions. OT focuses on exercises and training to help relearn everyday activities known as the Activities of daily living (ADLs) such as eating, drinking, dressing, bathing, cooking, reading and writing, and toileting. Speech and language therapy is appropriate for patients with problems understanding speech or written words, problems forming speech and problems with eating (swallowing).

Patients may have particular problems, such as complete or partial inability to swallow, which can cause swallowed material to pass into the lungs and cause aspiration pneumonia. The condition may improve with time, but in the interim, a nasogastric tube may be inserted, enabling liquid food to be given directly into the stomach. If swallowing is still unsafe after a week, then a percutaneous endoscopic gastrostomy (PEG) tube is passed and this can remain indefinitely.

Stroke rehabilitation should be started as immediately as possible and can last anywhere from a few days to several months. Most return of function is seen in the first few days and weeks, and then improvement falls off with the "window" considered officially by U.S. state rehabilitation units and others to be closed after six months, with little chance of further improvement. However, patients have been known to continue to improve for years, regaining and strengthening abilities like writing, walking, running, and talking. Daily rehabilitation exercises should continue to be part of the stroke patient's routine. Complete recovery is unusual but not impossible and most patients will improve to some extent: a correct diet and exercise are known to help the brain to self-recovery (Cuccurullo 2004).

2.8. Prognosis of stroke

Disability affects 75% of stroke survivors enough to decrease their employability (Coffey 2000). Stroke can affect patients physically, mentally, emotionally, or a combination of the three. The results of stroke vary widely depending on size and location of the lesion. Dysfunctions correspond to areas in the brain that have been damaged.

Some of the physical disabilities that can result from stroke include paralysis, numbness, pressure sores, pneumonia, incontinence, apraxia (inability to perform learned movements), and difficulties carrying out daily activities, appetite loss, vision loss, and pain. If the stroke is severe enough, or in a certain location such as parts of the brainstem, coma or death can result (Cuccurullo 2004).

Emotional problems resulting from stroke can result from direct damage to emotional centers in the brain or from frustration and difficulty adapting to new limitations. Post-stroke emotional difficulties include anxiety, panic attacks, flat affect (failure to express emotions), mania, apathy, and psychosis (Cuccurullo 2004).

Thirty to 50% of stroke survivors suffer post stroke depression, which is characterized by lethargy, irritability, sleep disturbances, lowered self esteem, and withdrawal (Senelick 1994). Depression can reduce motivation and worsen outcome, but can be treated with antidepressants.

Emotional lability, another consequence of stroke, causes the patient to switch quickly between emotional highs and lows and to express emotions inappropriately, for instance with an excess of laughing or crying with little or no provocation. While these expressions of emotion usually correspond to the patient's actual emotions, a more severe form of emotional lability causes patients to laugh and cry pathologically, without regard to context or emotion (Coffey 2000). Some patients show the opposite of what they feel, for example crying when they are happy (Villarosa, 1993). Emotional lability occurs in about 20% of stroke patients.

Cognitive deficits resulting from stroke include perceptual disorders, speech problems, dementia, and problems with attention and memory. A stroke sufferer may be unaware of his or her own disabilities, a condition called anosognosia. In a condition called hemispatial neglect, a patient is unable to attend to anything on the side of space opposite to the damaged hemisphere.

Up to 10% of all stroke patients develop seizures, most commonly in the week subsequent to the event; the severity of the stroke increases the likelihood of a seizure (Reith 1997; Burn 1997).

2.9. Recovery from impairments after stroke

The process of recovery from stroke usually follows a relatively predictable, stereotyped series of events in patients with stroke-induced hemiplegia. These sequences of events have been systematically described by several clinical researchers.

Twitchell (1951) published a highly detailed report describing the pattern of motor recovery following a stroke (pattern most consistent in patients with cerebral infarction in the MCA distribution). His sample included 121 patients, all except three having suffered either thrombosis or embolism of one of the cerebral vessels. Immediately following onset of hemiplegia there is total loss of voluntary movement and loss or decrease of the tendon reflexes. This is followed (within 48 hours) by increased deep tendon reflexes on the involved side, and then (within a short time) by increased resistance to passive movement (tone returns → spasticity), especially in flexors and adductors in the upper extremity (UE) and extensors and adductors in the lower extremity (LE). As spasticity increased, clonus (in ankle plantar flexors) appeared in 1–38 days post- onset of hemiplegia.

2.9.1. Recovery of movement:

Six to 33 days after the onset of hemiplegia, the first "intentional" movement (shoulder flexion) appears. In the UE, a flexor synergy pattern develops (with shoulder, elbow, wrist and finger flexion) followed by development of an extensor synergy pattern. Voluntary movement in the lower limb also begins with flexor synergy (also proximal—hip) followed by extensor synergy pattern. With increase of voluntary movement, there is a decrease in the spasticity of the muscles involved. Tendon reflexes remain increased despite complete recovery of movement.

At onset of hemiplegia, the arm is more involved than the leg, and eventual motor recovery in the leg occurs earlier, and is more complete, than in the arm. Most recovery takes place in the first three months and only minor additional recovery occurs after six months post onset.

2.9.2. Predictors of motor recovery:

2.9.2.1. Severity of arm weakness at onset:

With complete arm paralysis at onset, there is a poor prognosis of recovery of useful hand function (only 9% will gain good recovery of hand function).

2.9.2.2. Timing of return of hand movement:

If the patient shows some motor recovery of the hand by four weeks, there is up to 70% chance of making a full or good recovery. Poor prognosis with no measurable grasp strength by four weeks. Poor prognosis associated also with:

- Severe proximal spasticity. Prolonged "flaccidity" period
- Late return of proprioceptive facilitation (tapping) response > nine days
- Late return of proximal traction response (shoulder flexors/adductors) > 13 days

Brunnstrom (1966, 1970) and Sawner (1992) also described the process of recovery following stroke-induced hemiplegia. The process was divided into a number of stages:

- Flaccidity (immediately after the onset)
- No "voluntary" movements on the affected side can be initiated
- Spasticity appears
- Basic synergy patterns appear
- Minimal voluntary movements may be present
- Patient gains voluntary control over synergies
- Increase in spasticity
- Some movement patterns out of synergy are mastered (synergy patterns still predominate)
- Decrease in spasticity

- If progress continues, more complex movement combinations are learned as the basic synergies lose their dominance over motor acts.
- Further decrease in spasticity
- Disappearance of spasticity
- Individual joint movements become possible and coordination approaches normal
- Normal function is restored

2.10. Rehabilitation methods for motor deficits: Major theories of rehabilitation training

2.10.1 Proprioceptive Neuromuscular Facilitation (PNF) (Knott, 1968)

Uses spiral and diagonal components of movement rather than the traditional movements in cardinal planes of motion with the goal of facilitating movement patterns that will have more functional relevance than the traditional technique of strengthening individual group muscles.

Theory of spiral and diagonal movement patterns arose from observation that the body will use muscle groups synergistically related (e.g., extensors vs. flexors) when performing a maximal physical activity.

2.10.2. Brunstrom approach/Movement therapy (Brunnstrom, 1970)

Uses primitive synergistic patterns in training in attempting to improve motor control through central facilitation.

Based on concept that damaged CNS regressed to phylogenetically older patterns of movements (limb synergies and primitive reflexes); thus, synergies, primitive reflexes, and other abnormal movements are considered normal processes of recovery before normal patterns of movements are attained

2.10.3. Bobath approach /neurodevelopmental technique (NDT) (Bobath, 1978)

Probably, it is the most commonly used approach. The goal of NDT is to normalize tone, to inhibit primitive patterns of movement, and to facilitate automatic, voluntary reactions and subsequent normal movement patterns.

Based on the concept that pathologic movement patterns (limb synergies and primitive reflexes) must not be used for training because continuous use of the pathologic pathways may make it too readily available to use at expense of the normal pathways.

2.10.4. Motor relearning program/Carr and Shepard approach (Carr, 1985)

Based on cognitive motor relearning theory and influenced by Bobath's approach. Goal is for the patient to relearn how to move functionally and how to problem solve during attempts at new tasks.

2.10.5. Traditional Therapy

Traditional therapeutic exercise program consists of positioning, ROM exercises, strengthening, mobilization, compensatory techniques, endurance training (e.g., aerobics). Traditional approaches for improving motor control and coordination: emphasize need of repetition of specific movements for learning, the importance of sensation to the control of movement, and the need to develop basic movements and postures (Kirsteins, 1999).

2.10.6 Sensorimotor approach/Rood approach (Noll, 1996)

Modification of muscle tone and voluntary motor activity using cutaneous sensorimotor stimulation.

Facilitatory or inhibitory inputs through the use of sensorimotor stimuli, including, quick stretch, icing, fast brushing, slow stroking, tendon tapping, vibration, and joint compression to promote contraction of proximal muscles.

2.10.7 Behavioral approaches (Noll, 1996) include:

Kinesthetic or positional biofeedback and forced-use exercises

Electromyography biofeedback EMGBF: makes patient aware of muscle activity or lack of it by using external representation (e.g., auditory or visual cues) of internal activity as a way to assist in the modification of voluntary control.

2.11 Upper extremity common disorders after stroke (Black-Shaffer, 1999)

Shoulder pain: 70%–84% of stroke patients with hemiplegia have shoulder pain with varying degrees of severity. Of the patients with shoulder pain, the majority (85%) will develop it during the spastic phase of recovery.

It is generally accepted that the most common causes of hemiplegic shoulder pain are the shoulder-hand syndrome/reflex sympathetic dystrophy(RSD) and soft-tissue lesions (including plexus lesions).

2.11.1. Complex Regional Pain Syndrome Type I (CRPS, Type I) (Cuccurullo 2004, Braddom 2000)

Disorder characterized by sympathetic-maintained pain and related sensory abnormalities, abnormal blood flow, abnormalities in the motor system, and changes in both superficial and deep structures with trophic changes. Has been reported in 12% to 25% of hemiplegic stroke patients

Treatment (Arlet and Mazieres, 1997)

- ROM exercises involved joint-pain free within three weeks, most < four to six days with passive stretch of involved joints.
- Corticosteroids (systemic): a large majority of patients respond to systemic steroids instituted in the acute phase of the disease. Usually prednisone in doses up to 100–200 mg/day or 1 mg/kg, and tapered over two weeks.
- More effective in RSD confirmed by bone scan than on "clinical" RSD with negative bone scan. Bone scan may be useful not only in establishing the diagnosis of RSD, but also in identifying patients likely to respond to oral steroid therapy. In a study, 90% of the patients, with positive bone scan findings for RSD treated with corticosteroids had good or excellent

response, whereas 64% of the patients, without bone scan abnormalities had poor or fair response.

- Intra-articular injections with corticosteroids
- Analgesics (NSAIDs)
- Anticonvulsants (as Neurontin® or Tegretol®)
- TENS
- Contrast baths
- Edema control measures
- Desensitization techniques
- Ultrasound (U/S)
- Sympathetic ganglion blocks (i.e., stellate ganglion) may be diagnostic as well as therapeutic
- Local injections (procaine, corticosteroid)

2.11.2. Shoulder subluxation (Cuccurullo 2004, Braddom 2000)

Characterized by the presence of a palpable gap between the acromion and the humeral head. Etiology is unknown, but may be due to changes in the mechanical integrity of the glenohumeral joint.

Pathogenesis: factors that are thought to be related to shoulder subluxation include: angulation of the glenoid fossa, the influence of the supraspinatus muscle on the humeral head sitting, the support of the scapula on the rib cage, the contraction of the deltoid and rotator cuff muscles on the abducted humerus.

Treatment

- Shoulder slings: use is controversial
- Routine use of sling for the subluxed shoulder (or for shoulder pain) is not indicated.
- Friedland—sling does not prevent/correct subluxation, not necessary to support pain-free shoulder (Friedland, 1975)

- Hurd—no appreciable difference in shoulder ROM, subluxation, or shoulder pain in patients wearing slings or not (Hurd , 1974)
- Pros: May be used when patient ambulates to support extremity (may prevent upper extremity trauma, which in turn may cause increase pain or predispose to development of RSD)
- Cons: May encourage contractures in shoulder adduction/internal rotation, elbow flexion (flexor synergy pattern)
- Other widely used treatments for shoulder subluxation:
- Functional Electrical Stimulation (FES)
- Arm-board, arm trough, lapboard—used in poor upper-extremity recovery, primary wheelchair users
- Arm board may overcorrect subluxation
- Overhead slings—prevents hand edema (may use foam wedge on armboard)

Prevention of shoulder subluxation:

Subluxation may be prevented by combining the early reactivation of shoulder musculature (specifically supraspinatus and post- and mid-deltoid) with the provision of FES or a passive support of the soft-tissue structures of the glenohumeral joint (e.g., arm trough).

2.11.3. Brachial Plexus/Peripheral Nerve Injury (Cuccurullo 2004, Braddom 2000)

It is commonly caused by traction neuropathy, and clinical diagnosis could be: atypical functional return, segmental muscle atrophy, finger extensor contracture, delayed onset of spasticity. Electrodiagnostic studies (EMG)—lower motor neuron findings

Treatment:

- Proper bed positioning to prevent patient from rolling onto his paretic arm, trapping it behind his back or through the bed rails and place a traction stress on it.
- ROM to prevent contracture while traction avoided.

- 45-degree shoulder-abduction sling for nighttime positioning
- Sling for ambulation to prevent traction by gravity
- Armrest in wheelchair as needed

Prognosis—may require 8 to 12 months for re-innervation

2.12. Other medical complication after stroke

2.12.1. Spasticity: (Cuccurullo 2004, Braddom 2000)

Usually seen days to weeks after ischemic strokes. Usually follows classic upper-extremity flexor and lower-extremity extensor patterns. Clinical features include velocity-dependent resistance to passive movement of affected muscles at rest, and posturing in the patterns previously mentioned during ambulation and with irritative/noxious stimuli.

Treatment:

Noninvasive therapy: stretching program, splints/orthosis, serial casting, electrical stimulation, local application of cold.

Medications:

- The use of benzodiazepines, baclofen, dantrolene, and the alpha agonists clonidine and tizanidine, in stroke patients, remains controversial
- These drugs have modest effects on the hypertonicity and posturing associated with stroke and their side-effects limit their usefulness.

Injection of chemical agents:

- Botulinum toxin: may be particularly useful in control of increased tone in smaller muscles of the forearm and leg (e.g., brachioradialis, finger, wrist, and thumb flexors, in the upper extremity, and long and short toe flexors, extensor hallucis injury (EHL), and ankle invertors in the lower extremity)
- Phenol: may remain the agent of choice for injection of large muscle groups (e.g., hip adductors and extensors, the pectorals, lats, and biceps)

- Intrathecal baclofen: limited experience of its use in stroke patients; usefulness remains to be determined in this population.

Surgical procedures:

Uncommonly used in stroke, probably because of expected decrease in survival and increase in rate of medical co-morbidities. May be useful in selected cases when specific goals are pursued (e.g., increase in function, improve hygiene, decrease in pain).

2.12.2. Deep Vein Thrombosis (DVT)

Common medical complication after stroke; occurring in 20%–75% of untreated stroke survivors (60%–75% in affected extremity, 25% proximal DVT; PE, 1%–2%) (Cuccurullo 2004, Braddom 2000)

Diagnosis: Usually can be made using noninvasive techniques:

- Ultrasonography
- Impedance plethysmography
- Contrast venography reserved for cases with inconclusive results.
- D-dimer assays (a cross-linked fibrin degradation product): may be useful as screening tool for DVT in stroke patients

Treatment:

- Prophylaxis:
- Currently, recommended prophylaxis regimens include:
- Low dose subcutaneous (SQ) heparin/low molecular weight heparin
- Intermittent pneumatic compression (IPC) of the lower extremity (LE) (for patients with a contraindication to heparin).
- Gradient compression stockings in combination with SQ heparin or IPC.
- Surgery intervention

2.12.3. **Bladder Dysfunction** (Cuccurullo 2004, Braddom 2000)

Incidence of urinary incontinence has been recoded at 50%–70% during the first month after stroke and 15% after 6 months (similar to general population—incidence ≈ 17%.). Incontinence may be caused by CNS damage itself, UTI, impaired ability to transfer to toilet or impaired mobility, confusion, communication disorder/aphasia, and cognitive-perceptual deficits that result in lack of awareness of bladder fullness. Types of voiding disorders: areflexia, uninhibited spastic bladder (with complete/incomplete emptying), outlet obstruction.

Treatment: implementation of timed bladder-emptying program (Cuccurullo 2004)

- Treat possible underlying causes (e.g., UTI)
- Regulation of fluid intake
- Transfer and dressing-skill training
- Patient and family education
- Medications (if no improvement with conservative measures)
- Remove indwelling catheter—perform postvoid residuals, intermittent catheterization—perform urodynamics evaluation

2.12.4. **Bowel Dysfunction** (Cuccurullo 2004, Braddom 2000)

Patient unable to inhibit urge to defecate → incontinence. Incidence of bowel incontinence in stroke patients 31%. Incontinence usually resolves within the first two weeks; persistence may reflect severe brain damage. Decrease in bowel continence may be associated with infection resulting in diarrhea, inability to transfer to toilet or to manage clothing, and communication impairment/inability to express toileting needs

Therapy: treat underlying causes (e.g., bowel infection, diarrhea), timed-toileting schedule, training in toilet transfers and communication skills. Impairment of intestinal peristalsis—constipation

Management: adequate fluid intake/hydration, modify diet (e.g., increase in dietary fiber), bowel management (stool softeners, stool stimulants, suppositories), allow commode/bathroom privileges.

2.12.5. **Dysphagia** (Cuccurullo 2004, Braddom 2000)

Dysphagia (difficulty swallowing), in stroke, has an incidence of 30% to 45% (overall), 67% of brainstem strokes, 28% of all left hemispheric strokes, 21% of all right hemispheric strokes

More common in bilateral hemisphere lesions than in unilateral hemisphere lesions. More common in large-vessel than in small-vessel strokes. Predictors on bed-side swallowing exam of aspiration include:

- Abnormal cough
- Cough after swallowing
- Dysphonia
- Dysarthria
- Abnormal gag reflex
- Voice change after swallowing (wet voice) (Aronson, 1990)

As dysphagia is a frequent and potentially serious (because of aspiration) complication of stroke, careful bedside swallowing evaluation should be performed in all patients before oral feeding is started. If a patient is believed to be at high risk of recurrent aspiration after bedside and/or videofluoroscopic evaluation, he/she should be kept nothing per orum (NPO) and enterally fed, initially via NGT, and then via G-tube or J-tube if long-term enteral feeding is required (Cuccurullo 2004).

2.12.5.1. **Treatment of dysphagia/prevention of aspiration:** (Braddom 2000)

• Changes in posture and head position

• Elevation of the head of the bed

• Feeding in the upright position

• Chin tuck

• Turning the head to the paretic side

- Diet modifications (e.g., thickened fluids, pureed or soft foods in smaller boluses)
- Thermal stimulation (to sensitize the swallowing reflex)
- Oral/motor exercises (to improve tongue and lip strength, ROM, velocity, and precision, and vocal-fold adduction)

2.12.5.2. Recovery of dysphagia in stroke:

Few studies available on recovery of dysphagia in stroke:

Gresham (1990) reports his findings regarding 53 patients in a swallowing program poststroke. Eighty five percent (45/53) on full oral nutrition at discharge. Seventeen percent (9/53) could not drink thin liquids safely. And 8% (4/53) could not adequately maintain cohesive bolus of varied texture

Gordon (1987) found that 41 of 91 (45%) stroke patients + dysphagia, 90% of them were hemispheric lesions (17% bilateral). Swallowing function regained within 14 days in 86% (of patients who survived unilateral stroke)

Logemann (1991) reports that recovery of swallowing function in most brainstem strokes occurs in the first three weeks post-stroke

2.12.6. Aphasia

Aphasia is an impairment of the ability to utilize language due to brain damage. Characterized by paraphasias, word-finding difficulties, and impaired comprehension. Also common, but not obligatory, features are disturbances in reading and writing, nonverbal constructional and problem-solving difficulty and impairment of gesture (Cuccurullo 2004, Braddom 2000).

2.12.6.1. Recovery of Language Deficits/ Post Stroke Aphasia:

The greatest amount of improvement in patients with aphasia occurs in the first two to three months after the onset; after six months, there is a significant drop in the rate of recovery. In the majority of cases of patients with aphasia spontaneous recovery does not seem to occur after a year. However, there are

reports of improvements many years after their stroke in patients undergoing therapy. (Cuccurullo 2004, Braddom 2000)

Figure 2-3: Anatomic location of major speech areas

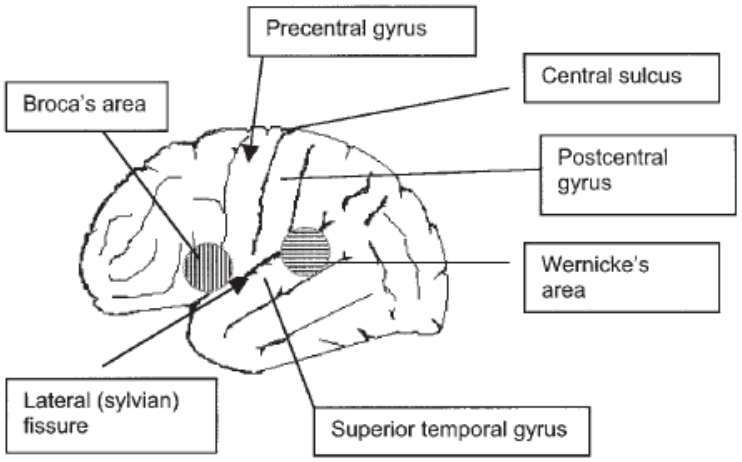


Table 2-6: Type of aphasia

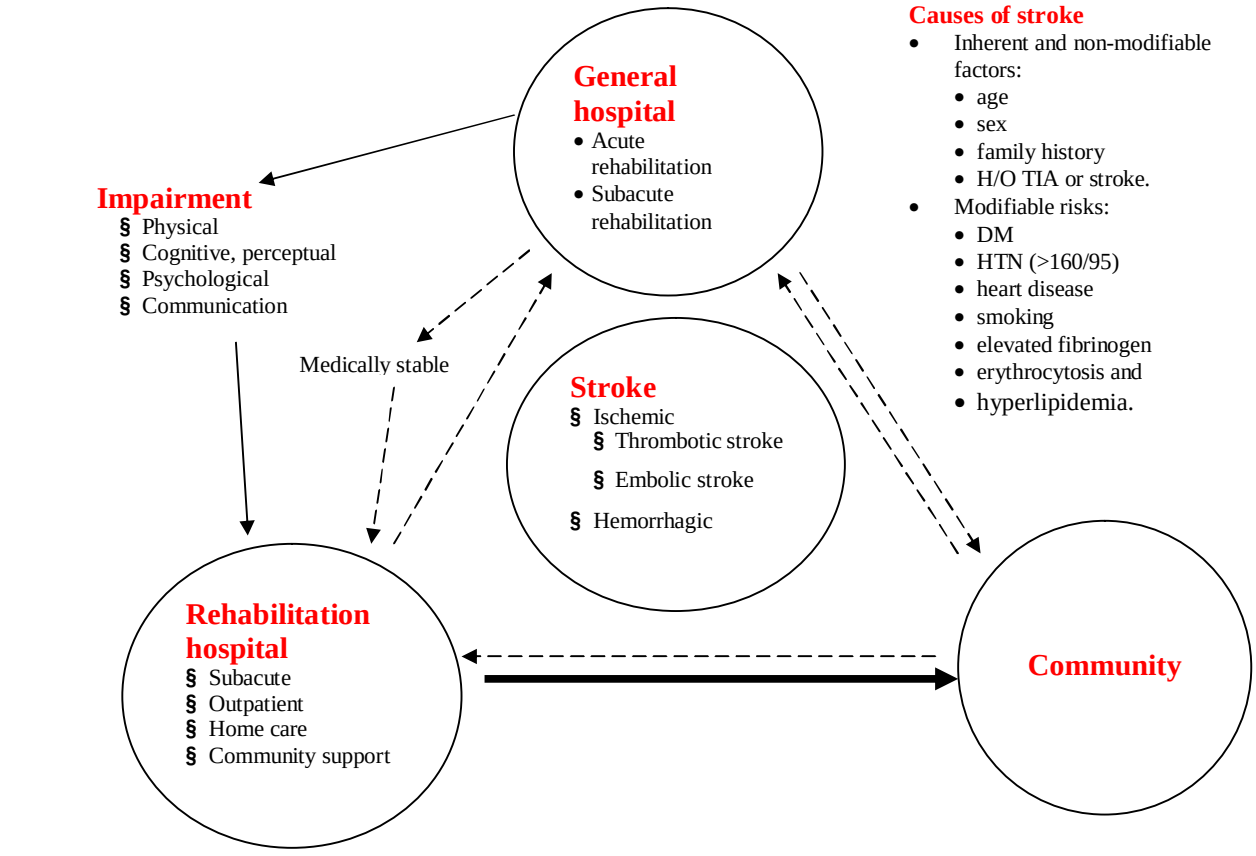
 **Wernicke's aphasia**	**Location:** posterior part of superior (first) temporal gyrus of the dominate (left) hemisphere
	Characteristics: Fluent speech (normal rate\speed) Impaired comprehension Word deafness, difficulty in reading (alexia) and writing (agraphia)
 **Broca's aphasia**	**Location:** posterior-inferior frontal lobe (third frontal convolution) of dominate (left) hemisphere → anterior to motor cortex areas that supply tongue, lips and larynx
	Characteristics: Non-fluent speech (telegraphic) Impaired repetition Preserved comprehension Paraphasias & articulatory errors or struggle
 **Global aphasia**	**Location:** vary in size and location but usually involve distribution of the left MCA (entire perisylvian region)
	Characteristics: Ranges from mutism (non-fluent) to total repetitive jargon or neologistic output (fluent but incomprehensible speech) Poor comprehension and repetition

2.13. **Negative factors of return to work** (Black-Shaffer and Osberg, 1990)

- Low score on Barthel Index at time of rehabilitation discharge
- Prolonged rehabilitation length of stay
- Aphasia
- Prior alcohol abuse
- (Barthel Index is a functional assessment tool that measures independence in ADLs on 0–100 scale)

Conceptual Framework

Stroke Rehabilitation Cycle



CHAPTER THREE

LITERATURE REVIEW

3.1. Definitions

According to the World Health Organization (WHO) stroke is defined as "rapidly developing clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than vascular origin" (Aho 1980, WHO Steps Stepwise Approach to Stroke-update 2006).

Elliot (2000), Braddom (200) defined stroke as "nontraumatic brain injury caused by occlusion or rupture of cerebral blood vessels that results in sudden neurological deficit characterized by loss of motor control, altered sensation, cognitive or language impairment, disequilibrium, or coma".

Stroke is a major health problem in all industrialized countries. It is the third leading cause of death and leaves many of its survivors with physical and mental disabilities, thus creating a major social and economic burden.(Kaste 1998)

Rehabilitation is defined as a multi-disciplinary and comprehensive process aimed at enabling an individual to function in their environments through biomedical and/or social interventions (Stineman, 2001; Brandt, 1997). The rehabilitation process spans a wide range of interventions – from regeneration of function at the tissue level (i.e. facilitating neuroplasticity after stroke), to capacity building in the individual (i.e. exercises designed to increase strength and flexibility of an injured limb), to social interventions aimed at reducing barriers to meaningful activities (i.e.improving attitudes and beliefs about certain disabilities).

The World Health Organization Quality of Life (WHOQOL) Group (Bonomi, 2000; WHOQOL Group, 1994, 1995) defined QOL as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (1995, p. 1403). This broad definition locates the QOL concept within the culture and social structure of the individual and focuses on her or his perceptions.

Quality of life as a scientific outcome is defined by patients' perceptions of performance in four areas: Physical and occupational function, psychological state, social interaction and somatic or bodily state (Schipper, 1990)

Spilker (1990) suggests that major domains of QOL by four categories: 1-physical status and functional abilities 2- psychological status and well-being 3-social interactions, and 4-economic status and factors.

Social support defined as "the experience of being cared for and loved, valued and esteemed, and able to count on others should the need arise." (McColl 1989). Different types of support have been showed to have different relationship with outcomes, like adjustment, quality of life and occupational function / while emotional support has consistently been shown to have a positive relationship to outcome. (McColl 1994)

The International Classification of Impairments, Disabilities and Handicaps (ICIDH) was published in 1980. It illustrates how disease can engender impairment, defined as a loss or abnormality of psychological, physiological, or anatomic structure or function. Impairment in turn may lead to disability, defined as a restriction or inability to perform an activity in a way considered normal for a human being. Handicap may arise either directly owing to impairments or because of disability after interaction with the physical or social environment. Handicap is defined as a disadvantage that restricts or prevents the performance of a role deemed normal. QOL is said to lie beyond the disease-handicap continuum. Although the ICIDH offers an important theoretical perspective, it neglects wider QOL issues. Although handicap is the most relevant clinical outcome for patients and impairment the least relevant, QOL may be even more pertinent from the patient's point of view.

In the recent years, the concept of International Classification of Function (ICF), activity defined as execution of a task or action by an individual. Body functions is physiologic functions of body systems. Body structures is anatomic parts of the body. Impairment is significant deviation or loss in body function or structure, and participation is involvement in life situation. Function is the integrated totality of one's body function, activity, and participation. The term disability is used as the antithesis of function and include impairment, activity limitation, and activity restriction. In its discussion of activity and participation, the ICF distinguishes between capacity and performance. (Gillen 2004)

3.2. Epidemiology of stroke

According to findings from the screening and registration of disabled in Gaza City, May 2003 done by Movimiento por La Paz, el Desarme y la Libertad (MPDL), 449 cases of stroke have been identified, representing 5.5% of the total number of disabilities found. 0.11 % of the population suffers from stroke (approximately I person in 1,000). The study showed that, in general, 90.0% of all strokes are related to disease such as ischemic/ hemorrhagic cerebrovascular disease. Men are found to have a higher rate of stroke related disabilities after the age of 50, and women after the age of 55. The age is a strong determining factor for the potential to have stroke related disabilities. In general, 56% of those having suffered from stroke are male while 44% are female. And according to findings in the Northern and Middle Areas of the Gaza Strip, October 2002, 455 cases of stroke were identified, representing 6.03% of the total number of the cases of

disabilities found. The overall rate, according to the total population surveyed, of stroke is 0.127%, meaning that for every 1000 people screened, approximately one case of stroke related disability is found. Of the cases found, 48.79% were found in males and 51.21 % were found in females, making stroke related disabilities one of two disability categories where females were a greater proportion of the disabled than males. 253 of the stroke related disability cases were found in the northern areas and 202 were found in the middle areas representing 55.60% and 44.40% of the cases respectively. The rate of stroke related disabilities was found to be strongly age dependent, although not generally dependent upon sex. Males were found to have a higher rate of stroke related disabilities in the age range between 45 and 59, but it appears that age is a strong determining factor in the potential of both men and women to have stroke related disabilities. 87.84% of stroke related disabilities were found in men above 50 years in age, and 87.55% of stroke related disabilities were found in women above 50.

Standardized stroke incidence ranged among areas from 437 to 743 per 100 000 for men and from 223 to 518 per 100 000 for women. Socioeconomic score correlated significantly with area-specific stroke rates among men ($r=-0.62$, $P=0.008$) and women ($r=-0.67$, $P=0.004$). Incidence of stroke was significantly associated with cardiovascular risk score for each area (men, $r=0.53$, $P<0.05$; women, $r=0.76$, $P<0.001$). The cardiovascular score and the socioeconomic score together accounted for 44% of the geographic variance among men and 63% among women (Engstrom 2001).

Liebetrau (2003) reported that, the prevalence of stroke at 85 years of age was 18.8% (self-reports, 10.7%; key informants, 13.2%; register data, 13.0%). The incidence of stroke between 85 and 88 years of age was 57.2/1000 person-years (men, 32.5/1000 person-years; women. 66.9/1000 person-years; self-reported, 30.8/1000 person-years; key informants, 38.5/1000 person-years; register data, 45.4/1000 person-years). Female sex (risk ratio [RR], 2.1; 95% confidence interval [CI], 1.0 to 4.8) and higher systolic blood pressure (per 10 mm Hg: RR, 1.14; 95% CI, 1.02 to 1.28) were associated with higher incidence of stroke. Baseline stroke was related to increased mortality in women and higher prevalence but not incidence of dementia. There was an association between incidence strokes and incidence dementia between 85 and 88 years of age (RR, 3.8; 95% CI, 2.2 to 6.7).

3.3. The causes and types of stroke

The causes of stroke can be grossly categorized as Hemorrhage or Ischemic. Intercrainal Hemorrhage accounts for 15% of all strokes and can be further divided into intracerebral (10%) subarachnoid (5%) hemorrhage. The remaining 85% of strokes are caused by ischemic brain injury resulting from large-vessel (40%) or small vessel (20%) thrombosis, cerebral embolism (20%), and other less common causes (5%), such as cerebral vasculitis or cerebral hypoperfusion (WHO, 1989). In 70-80% of cases stroke is caused by brain

infarctions, in 9-15% by intracerebral hemorrhages and in about 10% by subarachnoid hemorrhages (Kaste 1998).

McGruder (2006) found that Among 445, 452 hospital claims for stroke, 65.3% were ischemic, 20.9% were ill defined, 11.9% were hemorrhagic, and 1.9% were late effects of cerebrovascular disease. After controlling for age, women (odds ratio [OR],1.30; 95% CI, 1.28 to 1.32), blacks (OR, 1.31; 95% CI, 1.28 to 1.33), and Hispanics (OR, 1.27; 95% CI, 1.20 to 1.34) were more likely to receive a discharge diagnosis of ill defined compared with men and whites, respectively. Differences in age, sex, emergency room presentation, and evidence of diagnostic procedures accounted for some but not all racial disparities. In 14 states, ill-defined strokes constituted ≥25% of all stroke diagnoses.

In a cohort study identifying incident cases of stroke and TIA over a 5-year study period between 1992 and 1996 found that, age-adjusted annual incidence rate across all regions was 151 per 100 000 for stroke and 190 per 100 000 for TIA. There was almost a 2-fold difference in the incidence of cerebrovascular disease between the regions. The management of stroke and TIA in terms of antiplatelet prescription and of referral onward for further opinion to hospital specialists varied significantly between regions (Gibbs 2001)

A final discharge diagnosis of intracerebral or subarachnoid hemorrhage were correctly diagnosed by the emergency physicians (sensitivity, 100%; positive predictive value, 100%). Of the 351 patients with a final discharge diagnosis of ischemic stroke or transient ischemic attack, 346 were correctly identified by the emergency physicians (sensitivity, 98.6%; positive predictive value, 94.8%). Nineteen patients were diagnosed with stroke or transient ischemic attack by the emergency physician but had a final discharge diagnosis other than stroke. Discharge diagnoses included paresthesia or numbness of unknown causes (3), seizure (2), complicated migraine (2), peripheral neuropathy (2), cranial nerve neuropathy (2), psychogenic paralysis (1), and other (7) (Kothari 1995).

3.4. Gender and stroke

In a study conducted by Kapral (2005) which included 3323 patients, with 1527 women. Stroke symptoms at presentation were similar in women and men, except that women were more likely to present with headaches and were less likely to have brain stem or cerebellar symptoms. There were no sex differences in the use of neuroimaging, thrombolysis, antithrombotic therapy, or consultations. Women were less likely than men to receive care on an acute stroke unit, but this difference was no longer significant after adjustment for age and other factors. Women were more likely than men to be discharged to long-term care and had greater disability at 6 months. Mortality and quality of life at 6 months were similar in women and men.

3.5. Risk factors of stroke

Raised systolic (p less than 0.001) and diastolic (p = 0.02) blood pressure, antihypertensive treatment (p less than 0.001), previous myocardial infarction (p less than 0.001), prior stroke (p = 0.002), diabetes (p less than 0.001), and former daily smoking (p = 0.02) were identified as significant risk factors by univariate conditional logistic regression. No difference in risk was detected at different levels of alcohol consumption, salt intake, physical activity, or body mass index. Current smokers had virtually the same risk as nonsmokers. No association was found between stroke and the number of cigarettes smoked per day or the number of years of smoking. Multivariate conditional logistic regression identified diabetes (p = 0.002), raised systolic blood pressure (p less than 0.001), and former daily smoking (p = 0.01) as significant and independent risk factors. Previous myocardial infarction (p = 0.07), previous stroke (p = 0.1), and current daily smoking (p = 0.1) were of marginal significance (Ellekjaer 1992).

In a randomized controlled trial, 110 patients with symptoms and signs of an acute stroke were allocated to the stroke unit and 110 to general wards. The patients alive after 5 years were assessed by the Nottingham Health Profile (NHP) and the Frenchay Activities Index (FAI), which were the scales used as primary outcome measures for QOL. As secondary outcome measures the researchers used a global score for the NHP and a simple visual analogue scale (VAS). After 5 years, 45 of the patients treated in the stroke unit and 32 of those treated in general wards were alive. All surviving patients were assessed by the FAI. Thirty-seven (82.2%) of the stroke unit patients and 25 (78.1%) of the general wards patients were assessed by the NHP; 38 (84.4%) and 28 (87.5%), respectively, were assessed by the VAS. Patients treated in the stroke unit had a higher score on the FAI (P=0.0142). Assessment with the NHP showed better results in the stroke unit group for the dimensions of energy (P=0.0323), physical mobility (P=0.0415), emotional reactions (P=0.0290), social isolation (P=0.0089), and sleep (P=0.0436), although there was no difference in pain (P=0.3186). The global NHP score and VAS score also showed significantly better results in the stroke unit group (NHP, P<0.01; VAS, P<0.001). Patients who were independent in activities of daily living had significantly better QOL assessed by these scales than patients who were dependent. (Indredavik 1998)

Study done by Roth (2001) to examine the frequency, types, and clinical factors associated with medical complications that occur during inpatient rehabilitation found that, seventy-five percent of patients experienced 1 medical complication during rehabilitation. Significant factors for the development of any medical complication included greater neurological deficit (odds ratio [OR], 4.10; confidence interval [CI], 1.88 to 8.91), hypoalbuminemia (OR, 1.71; 95% CI, 1.15 to 2.52), and history of hypertension (OR, 1.81; 95% CI, 1.27 to 2.59). Nineteen percent of patients had a medical complication that required transfer to an acute care facility. Significant factors for transfers were elevated admission white blood

cell counts (OR, 1.92; 95% CI, 1.32 to 2.79), low admission hemoglobin levels (OR, 1.89; 95% CI, 1.32 to 2.68), greater neurological deficit (OR, 2.46; 95% CI, 1.37 to 4.39), and a history of cardiac arrhythmia (OR, 1.79; 95%CI, 1.18 to 2.67).

Several authors have reported a strong association between physical disability, dependency in ADL and QOL (Ahlsio 1984, Astrom 1992). Dependency in ADL has been shown to be associated with physical functioning and the general health domains of QOL (Anderson 1996, King 1996), but not to predict psychological and socioeconomic aspects of QOL (King 1996).

The correlation between age, sex and QOL has remained obscure. Anderson (1996) showed that women had a better stroke outcome in terms of social functioning and mental health, but most authors report QOL either to be independent of gender (Ahlsio 1984, Kwa 1998) or lower in females (Wyller 1997). QOL has been shown to decline with increasing age (Astrom 1992, Wyller 1997), but there are many studies with no differences between younger and older patients (Ahlsio 1984, Kwa 1998) or with life satisfaction increasing with increasing age (Wyller 1998).

Agewall (1998) found that sixty-four patients had an acute coronary event, and 37 had a stroke during the follow-up period. The Cox regression analyses revealed that the 3 dimensions of the Minor Symptoms Evaluation Profile (MSEP) at entry were significant predictors of stroke. The relationship between low contentment at entry and the incidence of stroke during follow-up remained significant (relative risk=1.04; 95% CI, 1.01 to 1.06; P=0.003) even after adjustment for other potential cardiovascular risk factors. Vitality also remained an independent predictor for stroke after adjustment for these potential cardiovascular risk factors (relative risk=1.04; 95% CI, 1.02 to 1.06; P<0.0001). There was no relationship between MSEP score at entry and myocardial infarction during follow-up.

3.6. Medical complications after stroke

Camilo O & Goldstein L. (2004) found that rate of early postischemic stroke seizures range from 2% to 33%. The rates of late seizures vary from 3% to 67%. The rate of postischemic stroke epilepsy is ≈2% to 4% and is higher in those who have a late seizure. Data reflecting seizure subtypes are limited. Aside from cortical location and, possibly, stroke severity, no other risk factors for postischemic stroke seizures have been consistently demonstrated. Results regarding the impact of postischemic stroke seizures on outcome are inconsistent.

Kalra (1995) reported that medical complications were more common in patients with severe strokes (97%). The frequency of reported complications was similar in both settings. Aspiration (33% versus 20%; P<.01) and musculoskeletal

pain (38% versus 23%; P<.05) were more commonly documented on the stroke unit, whereas urinary problems (18% versus 7%; P<.01) and infections (49% versus 25%; P<.01) were more commonly seen on general medical wards. The reported frequency of deep vein thrombi, pressure sores, and stroke progression was similar in both settings. Although depression was reported equally in both settings (34% on the stroke unit versus 27% on general wards), patients on the stroke unit were more likely to be treated compared with general wards (67% versus 36%; P<.05).

In multivariate analysis, increasing age (P<0.001) and previous cerebrovascular disease (P=0.007) were independently associated with infarct rather than hemorrhage. Atrial fibrillation was associated with all nonlacunar (P=0.02), total anterior circulation (P=0.007), and partial anterior circulation infarcts (P=0.02) compared with the lacunar group. All other risk factors were similar between infarct subtypes. Risk factors for hemorrhage subtypes were similar in multivariate analysis; increasing age was the only factor associated with primary intracerebral hemorrhage over subarachnoid hemorrhage (P<0.001). The black stroke population suffered significantly less atrial fibrillation (P=0.001) and engaged in less alcohol excess (P<0.001) and were less likely to have ever smoked (P<0.001). Hypertension (P<0.001) and diabetes mellitus (P<0.001) were more prevalent in the black population (Hajat 2001).

3.7. Stroke and Quality of life (QOL)

Study was done by Nichols-Larsen (2005) to examined the relationship of individual and clinical characteristics to HRQOL in stroke survivors with mild to moderate stroke during subacute recovery found that, age, gender, education level, stroke type, concordance (paretic arm=dominant hand), upper extremity motor function (Wolf Motor Function Test), and comorbidities were associated across SIS domains. Poorer HRQOL in the physical domain was associated with age, nonwhite race, more comorbidities, and reduced upper-extremity function. Stroke survivors with more comorbidities reported poorer HRQOL in the area of memory and thinking, and those with an ischemic stroke and concordance reported poorer communication.

Ahlsio (1984) in a study to concerns the quality of life of patients after stroke and how this is influenced by disablement and emotional factors. Ninety-six consecutive patients of mean age 71 years were followed for two years. At the end of that time 23% had experienced a recurrence of stroke and 27% were deceased. Of the survivors 76% were independent as regards activities of daily life (ADL) and lived in their own homes. Age as well as initial function were prognostically important factors. Patients who could participate in interviews marked on a visual analogue scale their evaluation of quality of life before and after stroke. Most of them had experienced a decrease and no improvement was observed during the two years. The deterioration was more pronounced in ADL dependent patients than

among the independent. However, depression and anxiety were found to be of similar importance for quality of life as was physical disablement. These findings call for a greater emphasis on psychological support in the care of post stroke patients. The visual analogue scale can be a useful tool for detecting special needs.

QOL as measured by the Health Utilities Index (HUI 2/3), with a median score of 0.9 for women and men. The median Stroke Impact Scale SIS-16 score was slightly lower in women (85.9 versus 92.2; P=0.0001), and this was significant even after adjustment for age and stroke type. This mean that QOL were similar in women and men at 6 months after stroke, women had a slightly worse functional status, as measured by the SIS-16, with a median score that was 6.3 points lower than that of men (Kapral, 2005).

Clarke, (2002) reported that, seniors who have experienced a stroke are more likely to report significantly lower scores on the mental health scale of the SF-36 ($t=5.92$; $P<0.001$) than seniors who have not had a stroke. In terms of social supports, stroke survivors and seniors who have not had a stroke report a similar number of people that they can count on for general help and support. However, in terms of their satisfaction with those supports, stroke survivors are much more likely to feel that their supports are not adequate for their needs. The question, "Do you ever feel that you need more support?" revealed that 32% of stroke survivors indicated that they were dissatisfied with their supports compared with only 22% of seniors without stroke ($\chi 2=15.52$, $P<0.001$).

A comprehensive review of all quality-of-life (QOL) estimates for stroke appearing in the peer-reviewed literature between 1985 and 2000 to examine variation in QOL weights and the rigor of methods used to assess QOL and discuss the implications for cost-utility assessment and resource allocation decisions found that, QOL estimates range from -0.02 to 0.71 (n=67) for major stroke, from 0.12 to 0.81 (n=14) for moderate stroke, from 0.45 to 0.92 (n=38) for minor stroke, and from 0.29 to 0.903 (n=42) for general stroke. Although QOL should decrease with severity, there were many instances in which the QOL for major stroke as reported by one study exceeded the QOL for moderate stroke as reported by another. The same reversal was found for moderate and minor stroke, and it occurred even when both authors used similar assessment methods and subject populations. Authors of cost-utility and decision analyses rarely base their choice of QOL weights on their own primary data (19%). When obtaining weights from secondary sources, some authors (23%) chose QOL weights for a severity of stroke that did not match the severity for which they sought data (Tengs 2001).

Study done by Duncan, (1997) found that all of the groups (stroke, Transit Ischemic Attack (TIA), asymptomatic) were highly independent in physical activities of daily living: 83% of the asymptomatic individuals, 81% of the individuals with TIA, and 66% of the stroke survivors scored 100 on the Barthel Index. The stroke group was significantly more impaired than the asymptomatic group in every dimension of the SF-36 (health status) except pain. Both

individuals with stroke and those with TIA had higher depression ratings on the Center for Epidemiological Studies Depression Scale (CESD) than did the asymptomatic group. The CESD scores were strongly correlated with SF-36 mental health score (-0.65) and emotional role function (-0.52). Individuals with TIA were similar to those with mild stroke, except that they were less impaired in physical function and physical roles and reported a higher incidence of pain. Health-related QOL, as measured by the time trade-off utility (TTO) and global utility indices, was lower for individuals with stroke. The asymptomatic and TIA groups did not differ in health-related QOL.

Study was done by Carod-Artal, (2003) showed that QOL perceived by SF-36 was significantly much lower in women (P=0.0001); the main differences were observed in the subscales physical functioning, mental health, emotional role, and vitality. Bodily pain was the only subscale that significantly decreased with age. Neither educational level nor marital status influenced scoring. Low QOL measured by SF-36 was significantly correlated with presence of depression and severe disability. SF-36 social function was affected more in disabled than in depressed patients (22.7 versus 40), while SF-36 vitality decreased slightly more in patients with post stroke depression (35.2 versus 41). Women perceived a lower QOL according to SF-36 score in all dimensions of this questionnaire (P=0.0001). SF-36 social function was correlated with the Frenchay Index FAI social activities category (r2=0.62).

Study conducted by (De Haan 1995) found that patients with left-sided lesions had more speech pathology ($P<.001$), there was slightly more QOL deterioration in patients with right-sided lesions. Patients with infratentorial strokes reported better overall functioning than patients with supratentorial strokes ($P=0.02$). Patients with lacunar infarction had less dysfunction compared to patients with (sub)cortical lesions ($P<0.001$). There was no difference in QOL between supratentorial (sub)cortical infarcts and hemorrhages. Lesion locations and stroke types did not affect patients' emotional distress. Severely impaired QOL patterns were related significantly to older age ($P<0.001$), comorbidity ($P=0.02$), stroke severity ($P<0.001$), and supratentorial lesions ($P=0.02$).

Stroke patients had a mean age of 74±11 years, and 120 (52%) were men. The mean age of caregivers was 65.7±12.5 years, 149 (64%) were females, and 116 (50%) had received caregiver training. The mean caregiver burden score was 48±13 and 38±11 (score range of bad to good 88 to 22) and QOL score was 75±16 and 75±15 (score range of bad to good 0 to 100) at 3 months and 1 year, respectively. Caregiver burden score and QOL correlated with each other and with patient (age, dependency, and mood), caregiver (age, gender, mood, and training), and support (social services and family networks) variables. Of these, only patient and caregiver emotional status, caregiver age and gender, and participation in caregiver training were independent predictors of either outcome at 3 months. Patient dependency and family support were additional independent predictors at 1

year. Social services support predicted institutionalization but not caregiver outcomes (McCullagh 2005).

After an average length of stay (LOS) of 43 days (range1-120) 80% of stroke patients returned home, 13% were discharged to nursing homes or extended care facilities, 7% were sent back to general hospitals for further evaluation and care, and 1 patient died. At the time of discharge 85% were ambulatory (28% requiring no aids, 57% needing some kind of supportive device such as a brace or a cane); only 15% were confined either to a wheelchair or to bed. Of the total group, 52% were completely independent in ADL, 4% required supervision but no aid, 42% required some aid with dressing/personal hygiene/meal preparation or feeding, and 24% required aid for bowel or bladder care (Feigenson 1997).

QOL was assessed by means of the Sickness Impact Profile (SIP) for 437 patients who had suffered a stroke 6 months earlier. For 108 patients who were not communicative because of cognitive or linguistic deficits, proxy ratings on the SIP were provided by the patients' significant others. For 228 of the 329 communicative patients, both self-reported and proxy SIP ratings were obtained. When mean SIP scores for patients with both self-reported and proxy-derived data available were compared, the proxy mean scores were generally in close agreement with those of the patients. However, systematic differences were noted for several SIP scales, with proxies rating patients as having more QOL impairments than the patients themselves. Intraclass correlations were moderate to high for most SIP subscales (average intraclass correlation coefficient [ICC]=.63), the physical (ICC=.85) and psychosocial dimensions (ICC=.61), and the total SIP score (ICC=.77). The proxy SIP scores were sensitive to differences in patients' functional health, which supports the validity of these ratings. For all patients combined, more QOL impairments were found for patients with supratentorial cortical or subcortical infarctions and hemorrhages than for patients with lacunar infarctions and infratentorial strokes. Although proxy respondents were more frequently needed for patients with the first two types of stroke, we found no evidence of biased results as a consequence of an unbalanced use of proxy respondents across the different types of stroke (Sneeuw 1997).

3.8. Rehabilitation of stroke

Inpatient rehabilitation facilities patients that were more likely to have a community-based discharge, compared with subacute rehabilitation programs patients, were patients with mild motor disabilities and FIM cognitive ratings of 23 or greater (adjusted odds ratio [AOR]=2.19; 95% CI: 1.52 to 3.14), patients with moderate motor disabilities (AOR=1.98; 95% CI: 1.49 to 2.61), patients with significant motor disabilities (AOR=1.26; 95% CI: 1.01 to 1.57) and patients younger than 82 with severe motor disabilities (AOR=1.43; 95% CI: 1.25 to 1.64). Inpatient rehabilitation facilities patients with significant and severe motor disabilities achieved greater motor function of 2 or more FIM units compared with

rehabilitation subacute rehabilitation programs patients. Medicare Part A payments for inpatient rehabilitation facilities were higher than rehabilitation subacute rehabilitation programs payments across all subgroups (Deutsch 2006).

A prospective community-based stroke incidence study was conducted in Australia to assess stroke after 5 years from onset, and found that, in total, 978 cases were recruited, 45% were male, and the mean age (±SD) was 75.5±13.8 years. Five years after stroke, 441 (45.1%) were alive and 356 were assessed (80.7%). Those assessed were more often born in Australia and older in age (both $P<0.05$). Seventy-one survivors (20%) had a very low HRQoL (score ≤0.1). The independent baseline predictors of low HRQoL at 5 years after stroke were increasing age, lower socioeconomic status, and markers of stroke severity (Paul 2005).

Of the original 1761 registered cases, 639 were still alive at 6-year follow-up, and all of these participated in the study. Case patients were more likely than control subjects to be dependent in all basic activities of daily living. Crude mean scores were lower for women; as age increased; for those living in institutions; when the SF-36 was completed by proxy; and when help was required with the activities of daily living. Cases had statistically lower mean scores than both the control group and New Zealand norms for physical functioning and general health. After standardization for age and sex, no differences were found between cases and controls in mental health and bodily pain (Hackett 2000). And the conclusions of this study were that health-related quality of life appears to be relatively good for the majority of patients 6 years after stroke. Despite significant ongoing physical disability, survivors of stroke appear to adjust well psychologically to their illness.

More than half of the subjects (64%) showed high or middle-range scores for psychological well-being 3 years after severe stroke. In a cluster analysis, depression was shown to have the strongest association with the subjects' Philadelphia Geriatric Center Morale Scale (PGCMS) scores. Variables including the subjects' social situation and functions as well as age, gender, ability to communicate, and need for help showed a much weaker association with the PGCMS (Lofgren, 1999).

The study of Hopman & Verner, (2003) showed that during rehabilitation, there were improvements in all 8 domains of the SF-36, although only 5 were statistically significant. After discharge, 1 domain continued to show statistically significant improvement (role physical functioning), and 2 showed nonsignificant improvement (physical functioning and vitality). However, there were marked and statistically significant declines in the other 5 domains of the SF-36 in the 6 months after discharge.

A close correlation was observed in all patients between depression, social activity, and stress caused to relatives. The scores on the individual scales were clearly worse than those for control subjects. The patients received approximately 5 months of rehabilitation after the stroke. Differences emerged between men and women for depression and social activities, with the women scoring worse. In reference to daily life, 70% of prestroke ability was required on average after rehabilitation. The daily activity score at the time of the interview was also strongly influenced by the discharge score. The majority of patients were retired. Of the total, 20.64% returned to work, but not always to the same job and often after readapting to new conditions. Of this population, only 31.5% were women. With regard to the population aged younger than 65 years, 21.42% returned to work. Lesions in the dominant hemisphere do not necessarily seem to rule out return to work, even if associated with aphasia. The main discriminating element was the ability to understand language. The patients were often criticized by their cohabitants; the criticisms most often raised concerned apathy, irritability, and self-centeredness. Sexual activity was depressed in almost all cases (Angeleri 1993).

Study was done by Sturm (2002) to assess validity of Assessment of Quality of Life (AQOL) instrument in a stroke population found that, overall AQOL utility scores and individual dimension scores were most highly correlated with relevant scales on the comparator instruments (the Medical Outcomes Short-Form Health Survey (SF-36); London Handicap Scale; Barthel Index; National Institutes of Health Stroke Scale; and Irritability, Depression, Anxiety scale.). AQOL scores clearly differentiated between patients in categories of severity of impairment and disability and between patients with total anterior circulation syndrome (TACS) and non-TACS. AQOL scores at 3 months after stroke predicted death and institutionalization at 12 months.

Study was done in Australia done by Paul, (2005) noted that 5-year survivors of stroke have poor HRQOL. QOL-assessment (AQOL) score was associated with gender, age, socioeconomic status, whether the individual lived independently before stroke, and country of birth ($P \leq 0.05$) indicates that the general population would prefer to halve their expected life span than have the life of the average stroke patient. Comorbidities and risk factors present at stroke onset that were associated with poor 5-year HRQOL were dementia, never drinking alcohol, and never smoking ($P \leq 0.05$). The baseline stroke-related variables of initial impairment National institute of health Stroke Scale (NIHSS), loss of consciousness, aphasia, hemiplegia, incontinence and neglect on admission were all associated with AQOL score at 5 years ($P \leq 0.05$).

Williams, (1999) reported that significant associated variables with better overall HRQOL were higher (better) Stroke-specific quality of life measure scales (SS-QOL) and Barthel Index scores, and lower (better) NIH Stroke Scale and Beck Depression Inventory scores. Independent predictors of good overall HRQOL were the SS-QOL score (odds ratio [OR], 2.97; 95% CI, 1.3, 7.1; p = 0.01) and

NIH Stroke Scale score (OR, 0.69; 95% CI, 0.47, 0.99; p = 0.05). Demographic factors and SF-36 scores were not associated with overall HRQOL ratings.

Previous studies have found the SF-36 instrument useful for measuring QOL in stroke patients (Bugge 2001, Anderson 1996). SF-36 has been tested and found suitable also for older adults. This is achieved if it is offered assistance with the questionnaire when necessary (Anderson 1996, Hayes 1995). The importance of obtaining the patients' own views on QOL has been emphasized, because they do not always correlate with objective measures (Addington-Hall 2001).

In a cohort follow-up study of 79 patients with ischemic and 11 with hemorrhagic stroke (41 women and 49 men; mean age, 68 years; range, 32 to 90 years) conducted at San Carlos University Hospital in Madrid, Spain to examine domain-specific quality of life in stroke survivors 1 year after stroke and to identify variables that could predict quality of life after stroke. Found that, thirty-eight percent of patients scored in the depressed range. Variables related to depression were status as a housewife, female sex, inability to work because of disability, and diminished social activity (P<0.0001). Mean total Sickness Impact Profile (SIP) (24.3), SIP psychosocial dimension (27.5), and SIP physical dimension (21.2) were correlated with disability, female sex, motor impairment, and depression (P<0.0001). The results showed that functional status and depression were identified as predictors of quality of life. Patients independent in their activities of daily living suffered from a deterioration of the psychosocial dimension of the SIP. (Carod-Artal 2000).

Study was done in Gaza Strip by Aljeesh (2005) to find predictors of quality of life among modifiable factors of compliance with the pharmacological and nonpharmacological therapeutic regimen in patients with hypertension compared to patients with stroke. Results show that self reported QOL is poorer in patients with stroke than in hypertensive patients. Male gender appears to be a strong predictor of quality of life in patients either with hypertension or stroke. Follow up health care programmes are essential for good quality of life among both patient groups. Diet, physical exercise, low level of stress are important factors for enhanced QOL. Current smoking seems to enhance the psychological and social dimensions for both patients groups. Multiple linear regression models indicate that low level of stress and male gender are genuine predictors of all dimensions of QOL among hypertensive patients, but not in stroke patients. It is concluded in this study that compliance with the pharmacological and non-pharmacological therapeutic regimen is strongly linked with a better QOL among patients with stroke and hypertension or hypertension only.

3.9. Outcome of stroke

There were 264 cases of cerebral infarction or intracerebral hemorrhage. Of surviving patients, 113 (59%) were assessed at 3 months and 107 (64%) at 12 months. The domains of handicap most affected were physical independence and occupation. Only half the variance in handicap was due to disability. Of patients without disability, those who claimed complete recovery were less handicapped than those who claimed incomplete recovery. Patients with total anterior circulation infarction were more handicapped at 3 and 12 months than those with other subtypes of cerebral infarction (Sturm 2002).

Randomized, controlled trial study done by Anderson (2000) found that, clinical outcomes for patients did not differ significantly between the groups at 6 months after randomization, but the total duration of hospital stay in the experimental group was significantly reduced (15 versus 30 days; $P<0.001$). Caregivers among the home-based rehabilitation group had significantly lower mental health SF-36 scores (mean difference, 7 points).

Age alone was a significant predictor of total FIM score and Motor FIM score at discharge, but not FIM change. For both total FIM score and Motor FIM score at discharge, age alone accounted for only 3% of the variation in outcome. For all the models, age explained at the most 1.3% of the variation in functional outcome after adjustment for other factors, such as admission FIM score (Bagg 2002).

Study done by Kelly (2001) found that fifty-eight cases were identified (mean age 69.2 years; 49 infarcts, 9 hemorrhages). Mean AFIM was 65.5, and mean DFIM was 89.8. Mean AFIM was significantly higher in the infarct than in the hemorrhage subgroup (70 versus 43, $P=0.006$). Mean DFIM was also higher in the infarct subgroup but did not reach statistical significance (93 versus 74, $P=0.1$). Follow-up information was obtained for 45 cases (78%) (mean interval 19.5 months). Median FFIM was 123.5. Outcome was significantly positively correlated with AFIM and initial presenting syndrome of vertigo/vomiting/ataxia/headache. Outcome correlated negatively with preexisting comorbidity score, altered level of consciousness at initial presentation, and superior cerebellar artery infarction. On multivariate analysis, AFIM and comorbidity score were independent predictors of outcome.

There is evidence to suggest that poor QOL was found in the areas of hand function, strength, and social participation with the highest areas in memory and communication (Deborah, 2005). Older stroke survivors, nonwhites, and those with more comorbidities and lower upper-extremity function reported poorer health related QOL (HRQOL) in the physical domain. Stroke survivors with more comorbidities reported poorer HRQOL in the area of memory and thinking; those with an ischemic stroke and concordance of paretic arm with dominant arm

reported poorer communication. The 3-way interaction with age, gender, and race was significant for both the emotion and social participation subscales. For social participation, this interaction indicated improved social participation for nonwhite men with increasing age, decreased participation for white men and nonwhite women with increasing age, and low scores across ages for white women. For emotion, this interaction delineated higher emotional QOL for younger white males than the other 3 groups, with nonwhite males having the lowest emotional QOL at younger ages. Women, both white and nonwhite, tended to have relatively stable emotional HRQOL across ages. All groups responded similarly at older ages.

It was evident that stroke had overwhelmed many peoples' lives: they ceased work too soon, their interpersonal relationships had deteriorated and over 70% viewed their future with uncertainty or gloominess. Physical disability in itself was less important than peoples' response to their disability; inappropriate and dysfunctional responses were present in over half. In spite of adequate medical care, 40% of subjects would have been assisted by social work assessment, counseling and direction to appropriate community services (Lawrence & Christie, 1979).

In a randomized controlled trial (RCT) study in subacute stroke survivors of 100 randomized subjects to examine treatment effects on outcomes assessed by Barthel index, Functional Independence Measure, instrumental activities of daily living, Medical Outcomes Study short-form 36-item questionnaire (SF-36), and Stroke Impact Scale (SIS) found that 93 survivors completed the post-intervention assessment, (mean age 70; 54% male; 81% white; mean Orpington Prognostic Score 3.4), and 80 had 6-month post-treatment assessment. Immediately after intervention, the intervention group improved more than usual care in SF-36 social function (14.0 points; P=0.0051) and in SIS (strength [9.2 points; P=0.0003], emotion [5.6 points; P=0.0240], social participation [6.6 points; P=0.0488], and physical function [5.0 points; P=0.0145]). Treatment was marginally more effective on Barthel score (3.3 points; P=0.0510), SF-36 (physical function [6.8 points; P=0.0586], physical role function [14.4 points; P=0.0708]), and SIS upper extremity function (7.2 points; P=0.0790). Effects were diluted 6 months after treatment ended (Studenski 2005).

In the study obtained by Jonsson, (2005) assessed stroke patients and their informal caregivers 4 months after stroke onset with the SF-36 questionnaire found a decrease in patients' in the domain physical function (P=0.017) and increases in social functioning (P=0.005), role limitations emotional (P=0.012), mental health (P=0.010), and mental component (P=0.001) compared with follow-up I. For caregivers, there were no significant changes between the two assessments. At follow-up II, the caregivers had higher mean scores than patients in 5 SF-36 domains and physical component.

Stroke cohort study was done in New Zealand done by Anderson, (2004) showed that nearly 70% greater risk of dying than individuals of the same age and sex in the general population. The risk of death was greatest (double) during the first 5 years after the onset of stroke. SF-36 profile was broadly similar to the general population, with no significant difference in finding.

In a randomized controlled trial study conducted by Indredavik (1997) to examine the long-term effects of the stroke unit care. After 5 years the results shows that, 38 (34.5%) of the patients randomized to the stroke unit and 20 (18.2%) of the patients randomized to the general wards were at home (P=.006). Sixty-five (59.1%) of the patients from the stroke unit and 78 (70.9%) of the patients from the general wards were dead (P=.041), while 7 (6.4%) and 12 (10.9%), respectively, were in an institution (eg, nursing home) (P=NS). Functional state was significantly better for patients treated in the stroke unit.

3.10. Outcome measure used after stroke

The functional independence measure (FIM) is one of the most widely used methods of assessing functional status in person with a disability. The FIM instrument was developed by a national task force co-sponsored by the American Academy of Physical Medicine and Rehabilitation and the American Congress of rehabilitation Medicine (Guide, 1993). The FIM is intended to serve as a basic indicator of the severity of disability. It is designed to measure what the patient actually dose, rather than what he or she is capable of doing. The FIM was designed primarily for inpatient acute rehabilitation populations and follow-up, but may also be appropriate for subacute rehabilitation and some home health programs (Charle 1997). Several studies have been conducted to examine the reliability and validity of the FIM. In a recent publication, Hamilton, (1994) examined interrater reliability; found that the intraclass correlation coefficient (ICC) value for total FIM scores was 0.96. The ICC values for subscale scores ranged from 0.88 to 0.93. Ottenbacher, (1995) recently reported similar ICC values for interreter and test-retest reliability of FIM for a sample of community-based elderly persons with disabilities.

Study was done by Anderson, (1996) showed that SF-36 was relatively quick and easy to use and had satisfactory internal consistency (Cronbach's α >0.7). For all eight SF-36 health scales, the mean scores for patients dependent in self care and with mental ill health were significantly different from patients without these disabilities, but the strength of the differences varied in a predictable manner, but it does not appear to characterize well social functioning. SF-36 is usually completed as a self-report questionnaire, but can also be administered by a trained interviewer. SF-36 widely used instrument was recommended by the Agency for Health Care Policy and Research (AHCPR) in the Post-Stroke Rehabilitation Clinical Practice Guidelines (1996).

Sabbah (2003) translated and cultural adapted SF-36 in Arabic language to measure QOL in urban and rural populations in Lebanon. The Arabic version of the SF-36 was administered in a cross-sectional study, to collect sociodemographic and environmental variables as well as self reported morbidity. Results showed that SF-36 scale scores showed wide variability and acceptable internal consistency (Cronbach's alpha >0.70), factor analysis yielded patterns of factor correlation comparable to that found in the U.S.A and France.

Patients resident in rural areas had higher vitality scores than those in urban areas. Older people reported more satisfaction with some domains of life than younger people, except for physical functioning. The QOL of women is poorer than men; certain symptoms and morbidity independently influence the domains of SF-36 in this population (Sabbah, 2003).

CHAPTER FOUR

MATERIALS AND METHODS

4.1. Study design

A Cross-Sectional study design was used in this research. It has been chosen because this method would be useful for descriptive analysis of the study, it is described as studies in which exposure and disease information collected at the same point in time, and gives insight into association between variables in the study and enables the researcher to meet study objective in short time, in addition, it is economical and less expensive than other design

4.2. Study population (Sample)

- All stroke survivors (males and females) who underwent rehabilitation treatment in El-Wafa hospital at the period from 1-1-2000 to 31-12-2006
- The total number of patients that underwent rehabilitation treatment is 444, 199 males which represent 44.81% and 245 females which represent 55.19%
- The research included 90 stroke survivors

4.2.1. Inclusion criteria:

Sampling were purposive with the following criteria: Participants

- Able and agree to give consent
- Had been hospitalized for a primary diagnosis of stroke (hemorrhagic or ischemic), with CT or MRI report
- Had completed inpatient rehabilitation
- Were at least 3 months post-stroke
- Age between 43 and 65 years
- And, who were ambulatory, even by assistive devices or wheelchair.

4.2.2. Exclusion criteria:

- Any individual who do not meet the inclusion criteria's was excluded from the study.

4.3. Sampling:

- Non-probability sampling. Convenience purposive sampling (Accidental, volunteer)

4.4. Data collection:

Data was collected at patient's home by the researcher and by trained 3 assistance. 15 minutes individual training how to manage the interview and how to interpretation of different responses of each question, and emphasis on access consolidated information for each patient

4.5. Instruments used:

4.5.1. Short Form-35 (SF-36)

Researcher used Short Form 36 (SF-36) questionnaire for getting research information about QOL by interviewing each patient by face to face interview. (**Appendix 4**)

The SF-36 was first made available in a "developmental" form in 1988 and in "standard" form in 1990. The standard form eliminated more than one fourth of the words contained in Medical Outcomes Study (MOS) versions of the 36 items and also reflected improvements in item wording, format and scoring (John 2000). The SF -36 is used extensively in the United States to determine general health status in health policy research and practice (Jenkinson 1994). The SF-36 was originally developed from the MOS Questionnaire which included 113 items related to all aspects of a person's general health and well-being (Stewart & Ware, 1992).

The SF-36 includes eight core domains involving 35 items. The final (36th) item is a supplementary question related to change in health status during the past years. The eight domains assessed by the SF-36 include: general health (5 items),

physical functioning (10 items), mental health (5 items), role limitation due to physical health (4 items), role limitation due to emotional problems (3 items), body pain (2 items), vitality (4 items), and social functioning (2 items). The eight domains are hypothesized to form two distinct higher-ordered clusters due to the physical and mental health variance that they have in common. The Physical Component Summary (PCS) consist from physical function, role limitation due to physical health, body pain, and general health. The Mental Component Summary (PCS) consist from vitality, social functioning, role limitation due to emotional problems, and mental health (Figure 1). Scoring the SF 36-ltem Health Survey is a two-step process. First, precoded numeric values are recoded per the scoring key given in Table 1. Note that all items are scored so that a high score defines a more favorable health state. In addition, each item is scored on a 0 to 100 range so that the lowest and highest possible scores are set at 0 and 100 respectively. Scores represent the percentage of total possible score achieved. In step 2, items in the same scale are averaged together to create the 8 scale scores. Table 2 fists the items averaged together to create each scale. Items that are left blank (missing data) are not taken into account when calculating the scale scores. Hence, scale scores represent the average for all items in the scale that the respondent answered. The SF-36 takes 20 -30 minutes to administer and score for each patient.

Figure 4-1: Component Summary

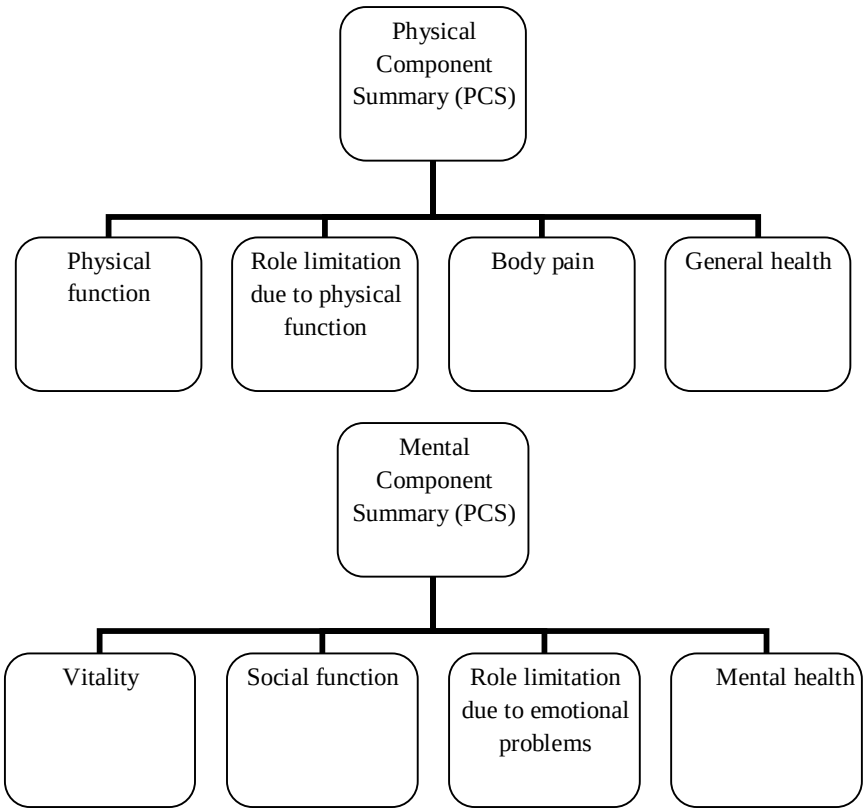


Table: 4-1

Step 1: Recoding items

Items number	Change original response category	To be recoded as (%) value of :
1,2,20,22,34,36	1 →	100
	2 →	75
	3 →	50
	4 →	25
	5 →	0
3.4,5,6.7,8,9.10,11.12	1 →	0
	2 →	50
	3 →	100
13.14,15,16.17,18,19	1 →	0
	2 →	100
21,23,26,27,30	1 →	100
	2 →	80
	3 →	60
	4 →	40
	5 →	20
	6 →	0
24,25,28,29,31	1 →	0
	2 →	20
	3 →	40
	4 →	60
	5 →	80
	6 →	100
32,33,35	1 →	0
	2 →	25
	3 →	50
	4 →	75
	5 →	100

Table: 4-2

Step 2: Averaging items to form the 8 domains

Domains	Number of items	After recoding per table 1, average the following items :
Physical functioning	10	3 4 5 6 7 8 9 10 11 12
Role limitations due to physical health	4	13 14 15 16
Role limitations due to emotional problems	3	17 18 19
Energy\fatigue	4	23 27 29 31
Emotional well-being	5	24 25 26 28 30
Social functioning	2	20 32
Pain	2	21 22
General health	5	1 33 34 35 36

The SF-36 was translated to Arabic language in Lebanon by three native Arabic speakers with excellent proficiency in English. Once the three translations were completed, discrepancies between them were resolved by a committee consisting of the translators. The committee created one unified translation of the SF-36. Then, the Arabic version of the SF-36 was back-translated by a native English speaker living in Lebanon, who was unaware of the original English language document. Once the back-translation was completed, the committee reconvened to review and resolve the discrepancies between the back-translation and the original document.

4.5.2. Functional Independent Measure (FIM)

FIM was used to measure patient's functional status to complete the follow-up field. The researcher will seek information about admission and discharge FIM scores from the patient's file. (**Appendix 6**)

In 1983, a national task force was established to develop a uniform data set for medical rehabilitation that would document the outcomes and cost of medical rehabilitation. The force recognized the need for the creation of a tool that could be used uniformly to measure the functional status of the person with long term needs (Guide 1993). The work of the task force, supported by a grant from the national institute of handicapped research (NIHR), resulted in the development of the FIM instrument and the creation of the uniform data set for medical rehabilitation. The data set includes admission, discharge, and follow-up FIM scores, which allow direct comparisons cross time from admission to discharge to follow-up, the

comparisons allow clinicians and administrators to determine patterns of care within the facilities.

The FIM is an ordinal scale covering 18 items. It uses a 7-point rating scale. Each item consists of maximum score of 7 and minimum score of 1. Total possible FIM scores range from 18 to 126. Each level of scoring is defined. For example, a score of 7 equals "complete independent", a score of 1 equals "complete dependence", and 3 equals "moderate assistance". The areas examined by the FIM include: self-care, sphincter control, transfers, locomotion, communication, and social cognition. These areas are further divided into motor and cognitive domains (Granger, 1993). The motor domain includes the items in the areas of self-care, sphincter control, transfers, and locomotion subscales. The cognitive domains include items from the subscales of communication and social cognitive. Ratings consider performance rather than capacity and may be based on observation, patient interview, or medical records. Evaluators are usually physicians, nurses, or therapists. The FIM takes 20 -30 minutes to administer and score for each patient.

4.5. Ethical considerations

- Ethical committee approval was obtained.
- Approval from El-Wafa hospital to apply this study.
- Written covering letter and informal consent forms were obtained from each patient. (**Appendix 7**)

4.6. Period of the whole study

- Starting month is Apr. 2007
- Finishing month is Apr. 2008

4.7. Setting

- This research was conducted at El-Wafa medical rehabilitation and specialized surgery hospital

4.8. Statistical analysis

SPSS (Statistical Package Scientific System-Version 15) was used for data entry and analysis

A data entry model used to complete data entry and then, data analysis was carried out as follows:

- Review of the filled questionnaire
- Coding the question
- Choosing appropriate entry model
- Coding variables
- Cleaning of data
- Frequency tables for all study variables
- Crosses tabulations of results

Statistical test between variables and QOL will be assessed using Chi-Square and the results will be statistically significant P. value accepted as statistically significant when the P. value less than 5% i.e. $P< 0.05$ (confidence interval 95%)

4.9. Limitation of the study

This study has several limitations.

- Contact with individuals was limited mostly to home visit, a limitation that obviously omitted individuals with wrong address, and phone number information or who has changed their address or phone number.
- Lack of information about the number of dead individuals.
- Too much missing data in El-Wafa hospital archive.
- Only 90 sample were found
- Limited available resources and literature such as journals and books.
- Very bad political, security and socioeconomic conditions that lead to absence lots of physical therapy professionals during this study.
- Lack of printed paper to copy the questionnaires in shop books and permanent power shut down during the period of writing thesis.

CHAPTER FIVE

RESULT

5.1. Introduction

In this chapter the researcher will view the results of this study by using the suitable statistical methods to answer the study questions.

5.2. Socio-demographic results of the study

As shown in the following table, the total numbers of stroke sample selected for the current study were a 90 of the all rehabilitated stroke patients in Gaza Strip.

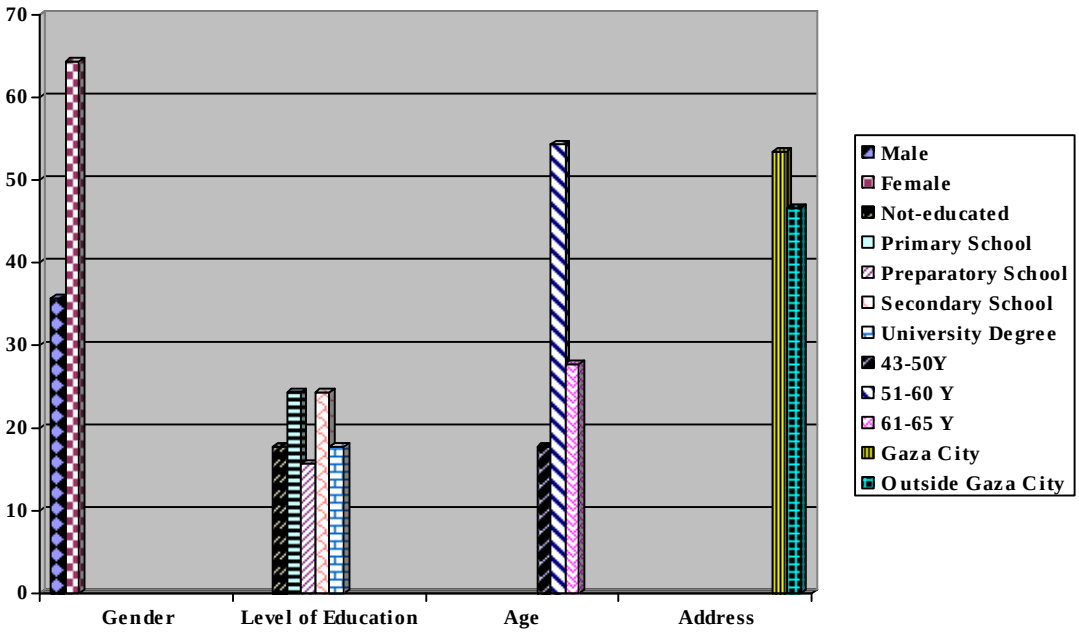
The higher number of the study sample 58 were females (64.4%), and the lower number 32 were male and represented (35.6%). More than half of the study sample lives in Gaza City 48 (53.3%), and 42 lives outside Gaza City (46.7%).

Age mean were 56.74 years with standard deviation 6.258 years. There were three age categories, the higher present were 54.4% at age between 51-60, followed by 27.8% at the age above 60 years, and the lowest present at age between 43 - 50 years.

In addition; 16 of the sample were not-educated (17.8%), 22 with primary school (24.4%),14 with preparatory school(15.6%), 22 with secondary school (24.4%), and 16 of the study sample had university and higher level education (17.8%).

Table 5-1: Distribution of the study sample according to socio-demographic variables

Categories	Subcategories	Frequency	Percentage
Age (Years)	43 - 50	16	17.8
	51 – 60	49	54.4
	Above 60	25	27.8
	Total	90	100.0
Gender	Male	32	35.6
	Female	58	64.4
	Total	90	100.0
Level of education	Not-educated	16	17.8
	Primary School	22	24.4
	Preparatory School	14	15.6
	Secondary School	22	24.4
	University Degree	16	17.8
	Total	90	100.0
Address	Gaza City	48	53.3
	Outside Gaza City	42	46.7
	Total	90	100.0



5.3. Health conditions

The most common stroke diagnosis were Ischemic type 82 (91.1%), 70 of them had the first stroke (77.8%), and 12 of them were with recurrent (13.3%), and only 8 were diagnosed as Hemorrhagic stroke (8.9%). Fifty had hemiplegia, and 40 had hemiparesis.

The most common affected body side was left side (55.6%), followed by right side (44.4%), and only (6.7%) were affected both lift and right body sides.

Speech disorders found to be diagnosed as Aphasia (20.0%), and dysarthria (18.9%), associated with 16.7% of central facial palsy.

High blood pressure were the most common chronic disease, hypertension accounted for 73.3% of the study sample, and nearly half (46.7%) of the study sample had diabetes, and only 11.1% had some heart disease, followed by epilepsy (3.3%). Hip fracture (2.2%), bronchial asthma (2.2%), and osteoporosis (1.1%). Regarding other health problems, double incontinent account 7.8% of the study sample.

Table 5-2: Health Conditions

Categories	Subcategories	Frequency	Percentage
Stroke Type	Ischemic	70	77.8
	Recurrent Ischemic	12	13.3
	Hemorrhagic	8	8.9
	Total	90	100.0
Type of Weakness	Hemiplegia	50	55.6
	Hemiparesis	40	44.4
	Total	90	100.0
Affected Body Side	Left Body Side	46	51.1
	Right Body Side	38	42.2
	Both Body Sides	6	6.7
	Total	90	100.0
Hypertension (High Blood Pressure)	Affected	66	73.3
	Not Affected	24	26.7
	Total	90	100.0
Diabetes (Blood Sugar)	Affected	42	46.7
	Not Affected	48	53.3
	Total	90	100.0
Heart Disease	Affected	10	11.1
	Not Affected	80	88.9
	Total	90	100.0
Speech Disorder	Aphasia	18	20.0
	Dysarthria	17	18.9
	No Problem	55	61.1
	Total	90	100.0
Facial Palsy	Affected	15	16.7
	Not Affected	75	83.3
	Total	90	100.0
Other Health Problems	Double Incontinent	7	7.8
	Epilepsy	3	3.3
	Hip Fracture	2	2.2
	Bronchial Asthma	2	2.2
	Osteoporosis	1	1.1
	No Problem	75	83.3
	Total	90	100.0

5.4. Quality of life domain

As defined by SF-36 quality of life consists of eight core domains involving 35 items. The final (36th) item is a supplementary question related to change in health status during the past years. The eight domains assessed by the SF-36 include: general health (5 items), physical functioning (10 items), mental health (5 items), role limitation (physical) (4 items), role limitation (emotional) (3 items), body pain (2 items), energy/tiredness (vitality) (4 items), and social functioning (2 items). The eight domains are hypothesized to form two distinct higher-ordered clusters due to the physical and mental health variance that they have in common. The Physical Component Summary (PCS) consist from physical function, role limitation due to physical health, body pain, and general health. The Mental Component Summary (PCS) consist from vitality, social functioning, role limitation due to emotional problems, and mental health

5.4.1. General health

Most of the study sample evaluates personal health as excellent (37.8%), or very good (32.2%), both will be 70.0% of the study sample, with expectation for good health in the future (53.3%) like any body else (62.2%), and believes it is likely to get better (53.3%). By combining the weight mean of each question related to general health, the researcher found that stroke survivors have 77.77% good QOL related to general health.

Table 5-3: General health (Weight mean=77.77)

Categories	Subcategories	Frequency	Percentage
General health (Wm=71.94)	Excellent (100)	34	37.8
	Very Good (75)	29	32.2
	Good (50)	13	14.4
	Fair (25)	10	11.1
	Poor (0)	4	4.4
Get sick a little easier than other people (Wm=80.3)	Definitely True (0)	5	5.6
	Mostly True (25)	6	6.7
	Don't Know (50)	8	8.9
	Mostly False (75)	17	18.9
	Definitely False (100)	54	60.0
Healthy as anybody I know (Wm=74.2)	Definitely True (100)	56	62.2
	Mostly True (75)	11	12.2
	Don't Know (50)	20	22.2
	Mostly False (25)	2	2.2
	Definitely False (0)	1	1.1
Expectation of health to get worse (Wm=76)	Definitely True (0)	3	3.3
	Mostly True (25)	6	6.7
	Don't Know (50)	25	27.8
	A Little of the Time (80)	8	8.9
	Definitely False (100)	48	53.3
Health is excellent (Wm=86.4)	Definitely True (100)	63	70.0
	Mostly True (75)	17	18.9
	Don't Know (50)	2	2.2
	Mostly False (25)	4	4.4
	Definitely False (0)	4	4.4

5.4.2. Physical function

As shown in the following table, the higher percent of the study sample were limited a lot to perform activities that require physical endurance and capacity (vigorous and moderate activities, lifting or carrying, climbing several flights of stairs, walking for more than 1.5 km), and almost half of the study sample also had a lot limitation performing bending, kneeling, or stooping, and walking for more than 1.5 km, and half of them had limited a little in performing activities of daily living, like dressing and bathing, and that means that they need's assistance in doing so, despite most of them reported no limitation at all to perform activities that require less physical endurance and capacity (walking for 100 m.). By combining the weight mean of each question related to physical function, the researcher found that stroke survivors have 40.89% good QOL related to physical functioning.

Table 5-4: Physical Function (Weight mean=40.89)

Categories	Subcategories	Frequency	Percentage
Vigorous activities (Wm=16.1)	Limited A Lot (0%)	67	74.4
	Limited A Little (50%)	17	18.9
	Not Limited At All (100%)	6	6.7
Moderate activities (Wm=22.78)	Limited A Lot (0%)	57	63.3
	Limited A Little (50%)	25	27.8
	Not Limited At All (100%)	8	8.9
Lifting or carrying (Wm=24.44)	Limited A Lot (0%)	57	63.3
	Limited A Little (50%)	22	24.4
	Not Limited At All (100%)	11	12.2
Climbing several flights of stairs (Wm=32.22)	Limited A Lot (0%)	47	52.2
	Limited A Little (50%)	28	31.1
	Not Limited At All (100%)	15	16.7
Climbing one flight of stairs (Wm=57.22)	Limited A Lot (0%)	23	25.6
	Limited A Little (50%)	31	34.4
	Not Limited At All (100%)	36	40.0
Bending, kneeling, or stooping (Wm=30.55)	Limited A Lot (0%)	51	56.7
	Limited A Little (50%)	23	25.6
	Not Limited At All (100%)	16	17.8
Walking for more than 1.5 km (Wm=40)	Limited A Lot (0%)	55	61.1
	Limited A Little (50%)	22	33.3
	Not Limited At All (100%)	25	14.4
Walking for 1.5 km (Wm=44.44)	Limited A Lot (0%)	35	38.9
	Limited A Little (50%)	30	46.7
	Not Limited At All (100%)	25	27.8
Walking for 100 m (Wm=80)	Limited A Lot (0%)	11	12.2
	Limited A Little (50%)	14	15.6
	Not Limited At All (100%)	65	72.2
Bathing and Dressing (Wm=61.11)	Limited A Lot (0%)	12	13.3
	Limited A Little (50%)	46	51.1
	Not Limited At All (100%)	32	35.6

5.4.3. Role limitation due to physical health

Two-third of study sample (71.95%) had limited role due to their physical health, so there were a cut down on the amount of time spent on work or other activities, accomplished less than they would like, were limited in the kind of work or other daily living activities, and had difficulty performing the work or other daily living activities, that means the higher present of the study sample complain from weakness in motor functioning that limited them to perform these activities like work or other daily activities that require good physical health, and as a result, they had limitations in their usual role. By combining the weight mean of each question related to role limitation due to physical health, the researcher found that stroke survivors only have 28.05% of good QOL related to role limitation due to physical health.

Table 5-5: Role limitations due to physical health (Weight mean 28.05)

Categories	Yes (0)		No (100)	
	Frequency	Percentage	Frequency	Percentage
Cut down on the amount of time spent on work or other activities (Wm=30)	63	70.0	27	30.0
Accomplished less than you would like (Wm=27.8)	65	72.2	25	27.8
Were limited in the kind of work or other activities (Wm=30)	63	70.0	27	30.0
Had difficulty performing the work or other activities (Wm=24.4)	68	75.6	22	24.4

5.4.4. Role limitations due to emotional problems

More than half of study sample (57.04%) reported limited role due to their emotional problems, this means that they had problems with work or other daily living activities as a result of emotional problems that are led to role limitation. The researcher combined the weight mean of each question related to role limitations due to emotional problems, and found that stroke survivors have 42.97% of good QOL related to role limitations due to emotional health.

Table 5-6: Role limitations due to emotional problems (Weight mean=42.97)

Categories	Yes (0)		No (100)	
	Frequency	Percentage	Frequency	Percentage
Cut down on the amount of time spent on work or other activities (Wm=48.9)	46	51.1	44	48.9
Accomplished less than you would like (Wm=38.9)	55	61.1	35	38.9
Didn't do work or other activities as carefully as usual (Wm=41.1)	53	58.9	37	41.1

5.4.5. Vitality

Most of the study sample felt full of life all of the time or at least most of their time, but the number decreased with having energy and feeling tired, they were not felt worn out all of the time. By combining the weight mean of each question related to vitality, the researcher found that stroke survivors have 71.6% of good QOL related to vitality.

Table 5-7: Vitality (Weight mean=71.6)

Categories	Subcategories	Frequency	Percentage
Feel full of life (Wm=71.78)	All of the Time (100)	31	34.4
	Most of the Time (80)	22	24.4
	A Good Bit of the Time (60)	20	22.2
	Some of the Time (40)	7	7.8
	A Little of the Time (20)	6	6.7
	None of the Time (0)	4	4.4
Have a lot of energy (Wm=67.55)	All of the Time (100)	27	30.0
	Most of the Time (80)	19	21.1
	A Good Bit of the Time (60)	18	20.0
	Some of the Time (40)	15	16.7
	A Little of the Time (20)	9	10.0
	None of the Time (0)	2	2.2
Feel worn out (Wm=76)	All of the Time (0)	3	3.3
	Most of the Time (20)	2	2.2
	A Good Bit of the Time (40)	5	5.6
	Some of the Time (60)	19	21.1
	A Little of the Time (80)	33	36.7
	None of the Time (100)	28	31.1
Feel tired (Wm=71.1)	All of the Time (0)	6	6.7
	Most of the Time (20)	3	3.3
	A Good Bit of the Time (40)	4	4.4
	Some of the Time (60)	22	24.4
	A Little of the Time (80)	32	35.6
	None of the Time (100)	23	25.6

5.4.6. Mental health

The higher percent of the study sample felt calm and peaceful, downhearted and blue, and were happy all of the time. Also the higher percent were not nervous, or a little of the time felt nervous. And they were not felt so down in the dumps that nothing could cheer up, or a little of the time felt so. By combining the weight mean of each question related to mental health, the researcher found that stroke survivors have 81.28% of good QOL related to mental health.

Table 5-8: Mental health (Weight mean=81.28)

Categories	Subcategories	Frequency	Percentage
Have been a very nervous person (Wm=74.22)	All of the Time (0)	10	11.1
	Most of the Time (20)	2	2.2
	A Good Bit of the Time (40)	0	00.00
	Some of the Time (60)	19	21.1
	A Little of the Time (80)	20	22.2
	None of the Time (100)	39	43.3
Have felt so down in the dumps that nothing could cheer up (Wm=81.55)	All of the Time (0)	5	5.6
	Most of the Time (20)	2	2.2
	A Good Bit of the Time (40)	4	4.4
	Some of the Time (60)	12	13.3
	A Little of the Time (80)	14	15.6
	None of the Time (100)	53	58.9
Have felt calm and peaceful (Wm=87.55)	All of the Time (100)	65	72.2
	Most of the Time (80)	7	7.8
	A Good Bit of the Time (60)	9	10.0
	Some of the Time (40)	5	5.6
	A Little of the Time (20)	4	4.4
	None of the Time (0)	0	00.00
Have felt downhearted and blue (Wm=78.66)	All of the Time (0)	2	2.2
	Most of the Time (20)	4	4.4
	A Good Bit of the Time (40)	4	4.4
	Some of the Time (60)	10	11.1
	A Little of the Time (80)	36	40.0
	None of the Time (100)	34	37.8
Have been a happy person (Wm=84.44)	All of the Time (100)	60	66.7
	Most of the Time (80)	11	12.2
	A Good Bit of the Time (60)	7	7.8
	Some of the Time (40)	5	5.6
	A Little of the Time (20)	5	5.6
	None of the Time (0)	2	2.2

5.4.7. Social functioning

The higher present of the study sample performs their normal social activities without interference due to physical or emotional problems. By combining the weight mean of each question related to social functioning, the researcher found that stroke survivors were functionally in their social activities within 71.39%.

Table 5-9: Social functioning (Weight mean=71.39)

Categories	Subcategories	Frequency	Percentage
Physical health or emotional problems interfered with social activities	Not at all (100)	44	48.9
	Slightly (75)	15	16.7
	Moderately (50)	16	17.8
	Quite a bit (25)	9	10.0
(Wm=72.78)	Extremely (0)	6	6.7
Physical health or emotional problems that interfered with social activities	All of the Time (0)	2	2.2
	Most of the Time (25)	13	14.4
	Some of the Time (50)	17	18.9
	A Little of the Time (75)	27	30.0
(Wm=70)	None of the Time (100)	31	34.4

5.4.8. Body pain

The number of the study sample decrease with severity of complaining pain, and the higher percent reported any limitations due to pain which can interfere with their normal work and activities of daily living. By combining the weight mean of each question related to body pain, the researcher found that stroke survivors have 76.24% of good QOL related body pain.

Table 5-10: Body pain (Weight mean=76.24)

Categories	Subcategories	Frequency	Percentage
Physical pain (Wm=71.1)	None (100)	29	32.2
	Very mild (80)	21	23.3
	Mild (60)	23	25.6
	Moderate (40)	8	8.9
	Severe (20)	6	6.7
	Very Severe (0)	3	3.3
How much did pain interfere with normal work (Wm=81.39)	Not at all (100)	57	63.3
	A little bit (75)	11	12.2
	Moderately (50)	13	14.4
	Quite a bit (25)	6	6.7
	Extremely (0)	3	3.3

5.4.9. Health compared to one year ago

Most of the study sample evaluates personal health better compared to one year ago, and by combining the weight mean of each question related to health compared to one year ago, the researcher found that stroke survivors have 67.78% of good QOL related to health compared to one year ago.

Table 5-11: Health Compared to one year ago (Weight mean=67.78)

Categories	Subcategories	Frequency	Percentage
Health Compared to one year ago (Wm=67.78)	Much better than one year ago (100)	33	36.7
	Somewhat better now than one year ago (75)	21	23.3
	About the same as one year ago (50)	18	20.0
	Somewhat worse now than one year ago (25)	13	14.4
	Much worse now than one year ago (0)	5	5.6

5.5. Quality of life (QOL)

QOL mean (2014.11), and standard deviation (747.073), minimum score were 230, and the maximum score were 3500.

More the half of the study sample had good QOL 50 (55.6%). And 40 of the study sample had low QOL (44.5%).

Table 5-12: Quality Of Life (QOL)

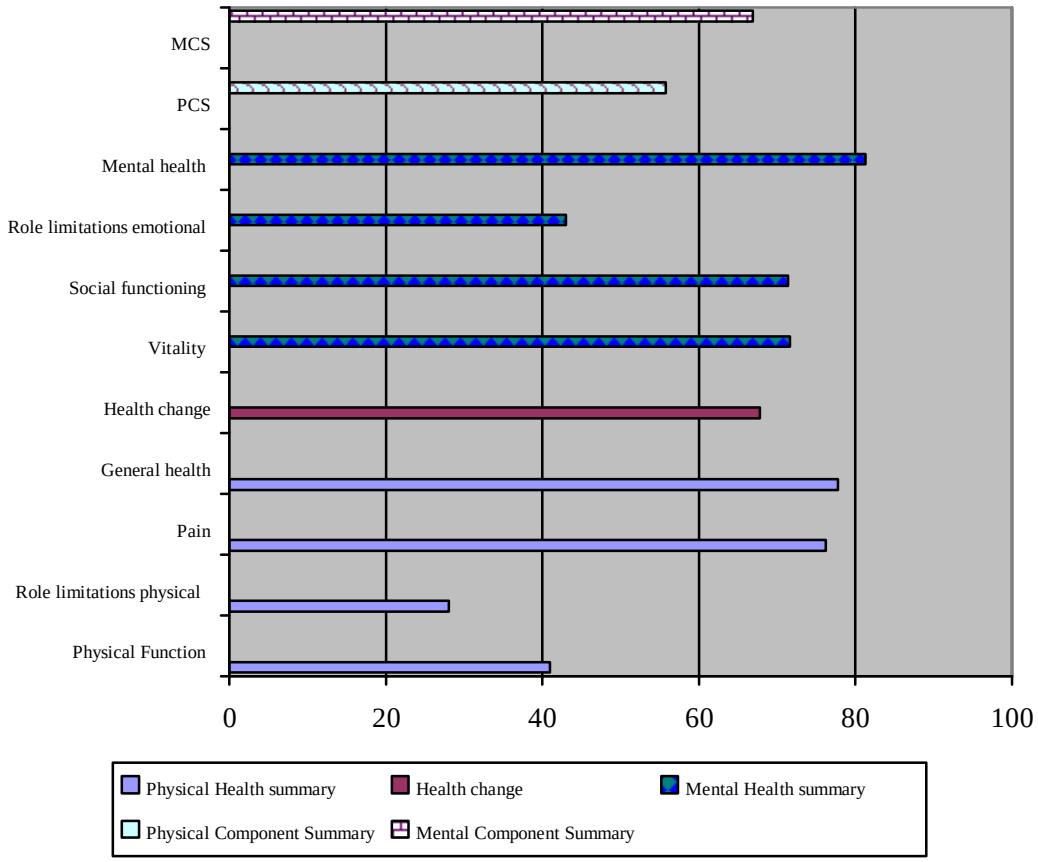
Categories	Subcategories	Frequency	Percentage
QOL	Low QOL	40	44.4
	Good QOL	50	55.6
	Total	90	100.0

As shown in the following table; study sample were better in Mental Component Summary (66.81%) compared with Physical Component Summary (55.74%)

In norm-based scoring, each scale was scored to have same average (50) and the same standard deviation (10 points). Without referring to norms, it is clear that anytime a scale score is below 50, health status is below average. By combining the weight mean of each question related to each domain, the study results shows that mental health were the best QOL domain, and represent 81.28%, followed by general health 77.77%, body pain 76.24%, vitality 71.6%, and social functioning 71.39%. The poorer health were role limitation physical 28.05%, followed by physical function 40.89%, and role limitation emotional 42.97%.

Table 5-13: Quality Of Life component summary

Categories	Subcategories	Health Percentage
Physical Component Summary (Wm=55.74)	Physical Function	40.89
	Role limitations due to physical health	28.05
	Body pain	76.24
	General health	77.77
	Health change	67.78
Mental Component Summary (Wm=66.81)	Vitality	71.6
	Social functioning	71.39
	Role limitations due to emotional problems	42.97
	Mental health	81.28



5.6. Functional Independent Measure (FIM)

The mean of FIM on admission were 59.88 with standard deviation 26.477. As shown in the following table, there were 37 of the study sample had score less than 50 (43.5%), 34 were between 51-89 (40.0%), and 14 were 90 and above (16.5%). The minimum score were 18, and the maximum score were 114. The correlation between QOL and FIM on Admission shows positive correlation coefficient (0.246), and this correlation is statistically significant (p-value = 0.023)

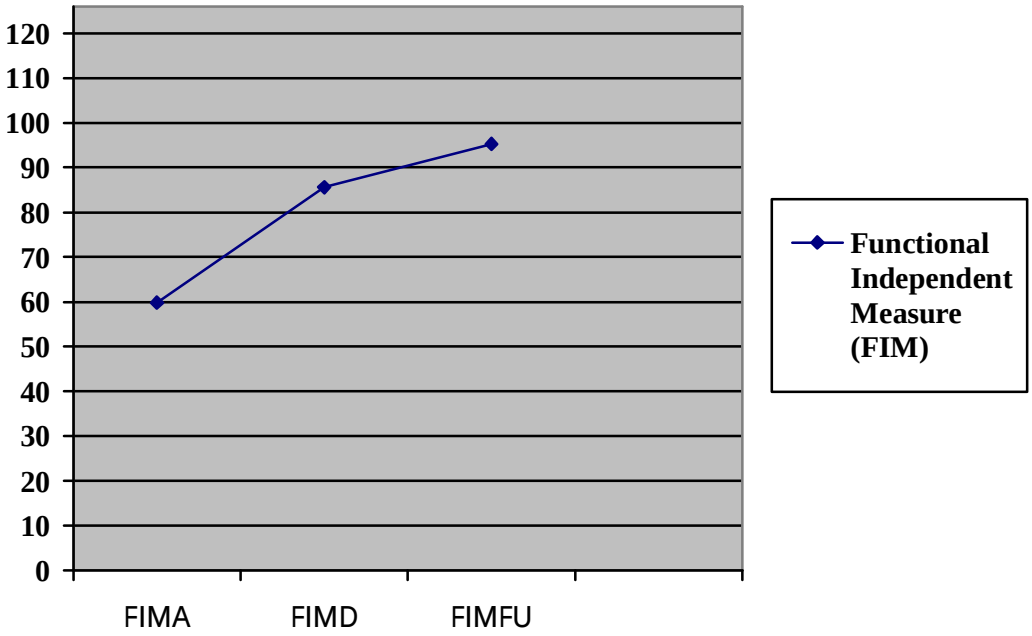
The mean of FIM score for study sample on discharge were 85.60 with standard deviation 30.460. There were 16 of the study sample had score less than 50 (19.0%), 26 were between 51-89 (31.0%), and 42 were 90 and above (50.0%). The minimum score were 26, and the maximum score were 126. The correlation between QOL and FIM on Admission shows positive correlation coefficient (0.366), and this correlation is statistically significant (p-value = 0.001)

The mean of FIM score for study sample on follow-up were 95.23 with standard deviation 22.735. There were 2 of the study sample had score less than 50 (2.2%), 36 were between 51-89 (40%), and 52 were 90 and above (57.8%). The minimum score were 21, and the maximum score were 126. The correlation between QOL and FIM on Follow Up shows positive correlation coefficient (0.662), and this correlation is very strongly statistically significant (p-value =0.000)

As shown in the following table, clearly improvement in functional status from admission to discharge, and from discharge to follow-up. And that's indicating effectiveness of the rehabilitation program conducted in El-Wafa rehabilitation hospital to improve functional status and outcome among this category of disability, and other psychosocial factors.

Table 5-14: Functional Independent Measure (FIM)

Categories	Subcategories	Frequency	Percentage
FIM on admission	Major Dependent	37	43.5
	Moderate Dependent	34	40.0
	Independent	14	16.5
	Total	85*	100.0
FIM on discharge	Major Dependent	16	19.0
	Moderate Dependent	26	31.0
	Independent	42	50.0
	Total	84**	100.0
FIM on follow-up	Major Dependent	2	2.2
	Moderate Dependent	36	40.0
	Independent	52	57.8
	Total	90	100.0
* Five missing values (n=85), ** Six missing values (n= 84)			



5.7. Determinate of Quality Of Life:

5.7.1. QOL and socio-demographic variables

More than half of the study sample had good QOL 50 (55.6%). According to gender, females had better QOL 31 (62.0%) than males 19 (38.0%), this results shows no statistical significant differences between gender and QOL among rehabilitated stroke survivors (P = 0.588).

Concerning age related QOL, age group between 50 and 60 years old reported better QOL 24 (48.0%) than other groups, followed by 16 of age above 61 years old (32.0%), and 10 of age group between 43 and 50 years old (20%), this results shows no statistically significant differences between age and QOL among rehabilitated stroke survivors (P= 0.388). The results of correlation between QOL and age shows negative correlation coefficient (-0.221), and this correlation is statistically significant (p-value = 0.036), that means advanced age had its negative effect on QOL.

There were strong statistical significant differences between level of education and QOL among rehabilitated stroke survivors (P= 0.009). The results shows that 16 of secondary school educated stroke survivors had best QOL (32.0%), followed by 12 university educated stroke survivors (24.0%) , 9 preparatory school (18.0%), 7 of non educated stroke survivors (14.0%), and at last 6 of Primary school educated stroke survivors (12.0%). One way ANOVA test between mean's revealed that there were significant mean's different between primary school and secondary school education (P=0.044). Combining the findings of this result—that is, that QOL were lower in low educational level and not-educated stroke survivors.

And there were no statistical significant differences between place of residency and QOL among rehabilitated stroke survivors (P= 0.156). The results shows that most of stroke survivors who lives in Gaza city had better QOL (60.0%) than stroke survivors who lives in outside Gaza city (40.0%). The result evidences preference living in city compared with living outside city

Table 5-15: QOL and socio-demographic variables

		Good QOL		Low QOL		P-value
		N	%	N	%	
Gender	Male	19	38.0	13	32.5	0.588
	Female	31	62.0	27	67.5	
	Total	50	100.0	40	100.0	
Age	43-50Y	10	20.0	6	15.0	0.388
	51-60Y	24	48.0	25	62.5	
	61+	16	32.0	9	22.5	
	Total	50	100.0	40	100.0	
Level of education	Not-educated	7	14.0	9	22.5	** 0.009
	Primary School	6	12.0	16	40.0	
	Preparatory School	9	18.0	5	12.5	
	Secondary School	16	32.0	6	15.0	
	University Degree	12	24.0	4	10.0	
	Total	50	100.0	40	100.0	
Address	Gaza City	30	60.0	18	45.0	0.156
	Outside Gaza City	20	40.0	22	55.0	
	Total	50	100.0	40	100.0	

*p< 0.05 **p< 0.01 ***p< 0.001

5.7.2. QOL and health conditions

The higher percent of good QOL were in ischemic stroke 41 (82.0%), followed by 4 recurrent stroke (8.0%), and 5 hemorrhagic stroke (10.0%), the results were not statistically significant differences between stroke types and QOL among rehabilitated stroke survivors (P= 0.156). The effect of stroke type may be indicative of the disparity in the number of ischemic versus hemorrhagic.

Hemiparesis had best QOL (52.0%) than hemiplegic stroke survivors (48.0%), but this result shows no statistically significant differences between type of weakness and QOL among rehabilitated stroke survivors (P= 0.107). Concerning this result, impairment of motor function has its impact on QOL, less motor deficit had better QOL than complete motor impairment of one of body side.

Although, left side affected stroke survivors had better QOL 26 (52.0%) than right side affected 21 (42.0%), and both body sides affected stroke survivors 3 (6.0%), the results shows not statistically significant differences between affected body side and QOL among rehabilitated stroke survivors (P= 0.954).

In contrast, equally number of stroke survivors (33) with and without hypertension reported good QOL (66.0%), and low QOL (82.5%), this results shows no statistically significant differences between hypertension and QOL among rehabilitated stroke survivors (P= 0.388).

Stroke survivors without diabetes had better QOL 26 (52.0%) than stroke survivors with diabetes 24 (48.0%), the results shows no statistically significant differences between diabetes and QOL among rehabilitated stroke survivors (P= 0.777).

Stroke survivors without heart disease had better QOL 45 (90.0%) than stroke survivors with heart disease 5 (10.0%), the results shows no statistically significant differences between heart disease and QOL among rehabilitated stroke survivors (P= 0.708).

Stroke survivors without any speech problem had better QOL 33 (66.0%) than stroke survivors with dysarthria 10 (20.0%), and aphasia 7 (14.0%), the results shows

no statistically significant differences between speech problem and QOL among rehabilitated stroke survivors (P= 0.281).

Although, stroke survivors without facial palsy had better QOL 44 (88.0%) than stroke survivors with facial palsy 6 (16.7%), the results shows no statistically significant differences between facial palsy and QOL among rehabilitated stroke survivors (P= 0.184).

And stroke survivors without any other health problems had better QOL 45 (90.0%) than stroke survivors with bronchial asthma 2 (4.0%), double incontinent 1 (2.0%), and epilepsy 1 (2.0%), the results shows no statistically significant differences between other health problems and QOL among rehabilitated stroke survivors (P= 0.113).

In conclusion of the finding of these results, stroke survivors without any health problems had better QOL than other stroke survivors with any health problem

Table 5-16: QOL and Health Condition

		Good QOL		Low QOL		P-value
		N	%	N	%	
Stroke Type	Ischemic	41	82.0	29	72.5	0.245
	Recurrent Ischemic	4	8.0	8	20.0	
	Hemorrhagic	5	10.0	3	7.5	
	Total	50	100.0	40	100.0	
Type of Weakness	Hemiplegia	24	48.0	26	65.0	0.107
	Hemiparesis	26	52.0	14	35.0	
	Total	50	100.0	40	100.0	
Affected Body Side	Lift side	26	52.0	20	50.0	0.954
	Right side	21	42.0	17	42.5	
	Both Body Sides	3	6.0	3	7.5	
	Total	50	100.0	40	100.0	
Hypertension (High Blood Pressure)	Affected	33	66.0	33	82.5	0.079
	Not Affected	17	34.0	7	17.5	
	Total	50	100.0	40	100.0	
Diabetes (Blood Sugar)	Affected	24	48.0	18	45.0	0.777
	Not Affected	26	52.0	22	55.0	
	Total	50	100.0	40	100.0	
Heart Disease	Affected	5	10.0	5	12.5	0.708
	Not Affected	45	90.0	35	87.5	
	Total	50	100.0	40	100.0	
Speech Disorder	Aphasia	7	14.0	11	27.5	0.281
	Dysarthria	10	20.0	7	17.5	
	No Problem	33	66.0	22	55.0	
	Total	50	100.0	40	100.0	
Facial Palsy	Affected	6	16.7	9	22.5	0.184
	Not Affected	44	88.0	31	77.5	
	Total	50	100.0	40	100.0	
Other Health Problems	Double Incontinent	1	2.0	6	15.0	0.113
	Epilepsy	1	2.0	2	5.0	
	Hip Fracture	1	2.0	1	2.5	
	Bronchial Asthma	2	4.0	0	0.00	
	Osteoporosis	0	0.00	1	2.5	
	No Problem	45	90.0	30	75.0	
	Total	50	100.0	40	100.0	

5.7.3. QOL and functional status

The higher percent of stroke survivors who were moderately dependent on admission to the rehabilitation hospital developed better QOL (45.8%) than major dependent stroke survivors (33.3%). Independent stroke survivors had the lowest QOL on admission (20.8%), the results shows no statistically significant differences between functional status on admission and QOL among rehabilitated stroke survivors (P= 0.089).

In contrast of discharge, most of independent stroke survivors had better QOL (63.8%) than moderately dependent (25.5%) and dependent stroke survivors (10.6%). This results shows strong statistically significant differences between functional status on discharge and QOL among rehabilitated stroke survivors (P= 0.011).

And there were very strong statistically significant differences between functional status on follow-up and QOL among rehabilitated stroke survivors (P= 0.000). The study results shows that the higher percent of stroke survivors who were independent on follow-up after discharge had better QOL (80.0%) than moderately dependent (20.0%)

Table 5-17: QOL and functional status

		Good QOL		Low QOL		P-value
		N	%	N	%	
FIMA	Major Dependent	16	33.3	21	56.8	0.089
	Moderate Dependent	22	45.8	12	32.4	
	Independent	10	20.8	4	10.8	
	Total	48	100.0	37	100.0	
FIMD	Major Dependent	5	10.6	11	29.7	*0.011
	Moderate Dependent	12	25.5	14	37.8	
	Independent	30	63.8	12	32.4	
	Total	47	100.0	37	100.0	
FIMFU	Major Dependent	0	0.0	2	5.0	*** 0.000
	Moderate Dependent	10	20.0	26	65.0	
	Independent	40	80.0	12	30.0	
	Total	50	100.0	40	100.0	
*p< 0.05		**p< 0.01		***p< 0.001		

5.8. Relationship between QOL domains and other variables

5.8.1. Physical function

Stroke survivors age between 43 and 50 years old had the higher percentage of good QOL related to physical function 8 (40.0%), followed by age between 51 and 60 years, and 61 and 65 years respectively 6 (30.0%). Eleven stroke survivors age between 51 and 60 years old had moderate QOL related to physical function (73.3%), followed by 3 of age between 61 and 65 years (20.0%), and 1 of stroke survivors age between 43 and 50 years old (6.7%). And 32 stroke survivors age between 51 and 60 years old had low QOL related to physical function (58.2%), followed by 16 of age between 61 and 65 years (29.1%), and 7 of stroke survivors age between 43 and 50 years old (12.7%). Younger stroke survivors had better QOL related to physical function than older survivors, that's mean age affect QOL related to physical function.

The result were statistically significant in differences between age and physical function (P= 0.025). One way ANOVA test between mean's revealed that there were significant mean's different between age group between 43 and 50 and age group between 51 and 60 years old (P=0.044)

University educated stroke survivors had the higher percentage of good QOL related to physical function 8 (40.0%), followed by 6 of secondary school educated (30.0%), 3 of preparatory school educated (15.0%), and 3 of not-educated stroke survivors respectively (15.0%). Secondary school educated stroke survivors had the higher percentage of moderate QOL related to physical function 7 (46.7%), followed by 3 of not-educated (20.0%), 2 of university educated (13.3%), and 2 preparatory school educated stroke survivors respectively (13.3%). Primary school educated stroke survivors had the higher percentage of low QOL related to physical function 21 (39.2%), followed by 10 of not-educated (18.2%), 9 of preparatory school educated (16.4%), 9 of secondary school educated (16.4%), and 6 of university educated stroke survivors (10.9%)

There were strong statistically significant differences between level of education and QOL related to physical function among rehabilitated stroke survivors (P= 0.003). One way ANOVA test between mean's revealed that there were significant mean's different between primary school and secondary school education (p=0.017), and there were strongly significant mean's different between primary school and university education (P=0.002)

5.8.2. Role limitation due to physical health

Stroke survivors age between 43 and 50 years old had good QOL related to role limitation due to physical function 8 (42.1%), followed by 6 of age between 51 and 60 years (31.6%), and 5 of age between 61 and 65 years respectively (26.3%). Two of stroke survivors age between 43 and 50 years old (40.0%), and 2 of age between 51 and 60 years (40.0%) respectively had moderate QOL related to role limitation due to physical function, and only 1 of stroke survivors age between 61 and 65 years old had moderate QOL related to role limitation due to physical function. And 41 stroke survivors age between 51 and 60 years old had low QOL related to role limitation due to physical function (61.1%), followed by 16 of age between 61 and 65 years (28.8%), and 6 of stroke survivors age between 43 and 50 years old (9.1%).

This result were strong statistically significant in differences between age and role limitation due to physical function among rehabilitated stroke survivors (P= 0.010). One way ANOVA test between mean's revealed that there were strongly significant mean's different between age group between 43 and 50 and age group between 51 and 60 years old (P=0.001), and there were significant mean's different between age group between 51 and 60 years and age group above 61 years old (p=0.025),

Secondary school educated stroke survivors had the higher percentage of good QOL related to role limitation due to physical function 9 (47.4%), followed by 6 of university educated (31.6%), 2 of preparatory school educated (20.0%), and 2 of primary school educated stroke survivors respectively (20.0%). University educated stroke survivors had the higher percentage of moderate QOL related to role limitation due to physical function 4 (80.0%), followed by only 1 of preparatory school educated stroke survivors (20.0%). Primary school educated stroke survivors had the higher percentage of low QOL related to role limitation due physical function 20 (30.3%), followed by 16 of not-educated (24.29%), 13 of secondary school educated (19.7%), 11 of preparatory school educated (16.7%), and 6 of university educated stroke survivors (9.1%).

This result were very strong statistically significant in differences between level of education and role limitation due to physical function among rehabilitated stroke survivors (P= 0.000). One way ANOVA test between mean's revealed that there were strongly significant mean's different between age group between 43 and 50 and age group between 51 and 60 years old (P=0.001), and there were significant mean's different between age group between 51 and 60 years and age group above 61 years old (P=0.025),

Hemiparesis stroke survivors had the higher percentage of good QOL related to role limitation due to physical function 13 (68.4%), followed by 6 of hemiplegic stroke survivors (31.6%). Although; Hemiparesis stroke survivors had the higher percentage of moderate QOL related to role limitation due to physical function 3 (60.0%), followed by 2 of hemiplegic stroke survivors (40.0%). And conversely; hemiplegic stroke survivors had the higher percentage of low QOL related to role limitation due to physical function 42 (63.6%), followed by 24 of hemiparesis stroke survivors (36.4%)

This result were statistically significant in differences between type of weakness and role limitation due to physical function among rehabilitated stroke survivors (P= 0.036). T-test showed statistical significant difference between the two group means (P=0.010).

Interestingly, stroke survivors with hypertension had the higher percentage of good QOL related to role limitation due to physical function 10 (52.6%), followed by 9 of stroke survivors without hypertension (47.4%). Although; Stroke survivors with hypertension had moderate QOL related to role limitation due to physical function 5 (100.0%). And the stroke survivors with hypertension had the higher percentage of low QOL related to role limitation due to physical function 51 (77.3%), followed by only 15 of stroke survivors without hypertension (22.7%).

This result were statistically significant in differences between hypertension and role limitation due to physical function among rehabilitated stroke survivors (P= 0.039).

5.8.3. Vitality

Secondary school educated stroke survivors had the higher percentage of good QOL related to vitality 16 (26.7%), followed by 14 of university educated (23.3%), 11 of primary school educated (18.3%), 10 of preparatory school educated (16.7%), and 9 of not-educated stroke survivors respectively (15.0%). The same number of primary school educated and not-educated stroke survivors had the higher percentage of moderate QOL related to vitality 7 (28.0%) respectively, followed by 6 of secondary school educated (24.0%), 4 of preparatory school educated (16.0%), and 1 of university educated stroke survivors (4.0%). Primary school stroke survivors had the higher percentage of low QOL related to vitality 4 (80.0%), followed by only 1 of university educated stroke survivors (20.0%).

This result were strong statistically significant in differences between level of education and vitality among rehabilitated stroke survivors (P= 0.044).

The results shows that the higher percent of stroke survivors who lives in Gaza city had good QOL related to vitality 37 (61.7%), followed by 23 stroke survivors who lives in outside Gaza city (38.3%). And the higher percent of stroke survivors who lives in outside Gaza city had moderate QOL related to vitality 14 (56.0%), followed by 11 stroke survivors who lives in Gaza city (44.0%). And only 5 of stroke survivors who lives in outside Gaza city had low QOL related to vitality (100.0%).

There were statistically significant differences between place of residency and vitality among rehabilitated stroke survivors (P= 0.016). T-test showed strongly statistical significant difference between the two group means (P=0.006).

5.8.4. Mental health

Secondary school educated stroke survivors had the higher percentage of good QOL related to mental health 22 (28.2%), followed by 17 of primary school educated (21.8%), 14 of university educated and preparatory school educated respectively (17.9%), 2 of preparatory school educated (20.0%), and 11 of not-educated stroke survivors respectively (14.1%). Primary school educated stroke survivors had the higher percentage of moderate QOL related to mental health 4 (66.7%), followed by only 2 of not-educated stroke survivors respectively (33.3%). Not-educated stroke survivors had the higher percentage of low QOL related to mental health 3 (50.0%), followed by 2 of university educated (33.3%), and only 1 of primary school educated stroke survivors (16.7%).

This result were statistically significant in differences between level of education and mental health among rehabilitated stroke survivors (P= 0.029).

The higher percent of stroke survivors who lives in Gaza city had good QOL related to mental health 47 (60.3%), followed by 43 stroke survivors who lives in outside Gaza city (39.7%). And all of stroke survivors who lives in outside Gaza city had moderate QOL related to mental health 6 (100.0%). And 5 of stroke survivors who lives in outside Gaza city had low QOL related to mental health (83.3%), followed by only 1 stroke survivors who lives in Gaza city (16.7%).

This result were strong statistically significant in differences between place of residency and mental health among rehabilitated stroke survivors (P= 0.003). T-test showed strongly statistical significant difference between the two group means (P=0.003)

Interestingly, stroke survivors without facial palsy had the higher percentage of good QOL related to mental health 66 (84.6%), followed by 12 of stroke survivors with facial palsy (15.4%). Although; All of stroke survivors without facial palsy had moderate QOL related to role mental health 6 (100.0%). And the same number of stroke survivors with and without facial palsy had low QOL related mental health 3 (50.0%).

This result were statistically significant in differences between facial palsy and mental health among rehabilitated stroke survivors (P= 0.048).

5.8.5. Social function

Hemiparesis stroke survivors had the higher percentage of good QOL related to social function 33 (51.6%), followed by 31 of hemiplegic stroke survivors (48.4%). And conversely; hemiplegic stroke survivors had the higher percentage of low QOL related to social function 19 (73.1%), followed by 7 of hemiparesis stroke survivors (26.9%)

This result were statistically significant in differences between type of weakness and social function among rehabilitated stroke survivors (P= 0.033). T-test considered statistical significant difference between the two group means (p=0.033).

5.8.6. General health

University educated, secondary school educated, and primary school educated stroke survivors respectively had the higher percentage of good QOL related to general health 15 (24.2%), followed by 9 of preparatory school educated (14.5%), and 8 of not-educated stroke survivors (12.9%). Secondary school educated and not-educated stroke survivors respectively had the higher percentage of moderate QOL related to general health 7 (33.3%), followed by 5 of preparatory school educated (23.8%), and 2 primary school educated stroke survivors (9.5%). Primary school educated stroke survivors had the higher percentage of low QOL related to general health 5 (71.4%), followed by 1 of university educated (13.4%), and 1 not-educated stroke survivors (13.4%)

This result were strong statistically significant in differences between level of education and general health among rehabilitated stroke survivors (P= 0.006).

Although; There were strong statistically significant differences between place of residency and general health among rehabilitated stroke survivors (P= 0.007). And T-test showed statistical significant difference between the two group means (P=0.003). The results shows that the higher percent of stroke survivors who lives in Gaza city had good QOL related to general health 38 (61.3%), followed by 24 stroke survivors who live in outside Gaza city (38.7%). Almost the same number of stroke survivors who lives in outside, inside Gaza city had moderate QOL related to general health 11 (56.0%), and 10 (47.6%) respectively. And only 7 of stroke survivors who lives in outside Gaza city had low QOL related to general health (100.0%).

Table 5-18: QOL domains and socio-demographic variables

	Gender	Age	Level of education	Address
PF	P= 0.490	*P= 0.025	**P= 0.003	P= 0.054
RLF	P= 0.101	**P= 0.010	***P= 0.000	P= 0.819
RLE	P= 0.138	P= 0.120	P= 0.072	P= 0.242
VIT	P= 0.648	P= 0.343	*P= 0.044	**P= 0.016
MH	P= 0.745	P= 0.794	*P= 0.029	**P= 0.003
SF	P= 0.714	P= 0.906	P= 0.069	P= 0.071
PAIN	P= 0.858	P= 0.666	P= 0.338	P= 0.397
GH	P= 0.471	P= 0.706	**P= 0.006	**P= 0.007
*p< 0.05		**p< 0.01		***p< 0.001

Table 5-19: QOL domains and health conditions

	Stroke Type	Type of Weakness	Affected Body Side	Hypertension	Diabetes	Heart Disease	Speech Disorder	Facial Palsy	Other
PF	P= 0.736	P= 0.060	P=0.696	P= 0.109	P= 0.729	P= 0.614	P=0.417	P= 0.514	P= 0.641
RLF	P= 0.577	*P= 0.036	P= 0.909	*P= 0.039	P= 0.248	P= 0.705	P= 0.548	P= 0.717	P= 0.936
RLE	P= 0.982	P= 0.066	P= 0.060	P= 0.313	P= 0.806	P= 0.554	P= 0.191	P= 0.681	P= 0.151
VIT	P= 0.708	P= 0.411	P= 0.825	P= 0.325	P= 0.413	P= 0.521	P= 0.130	P= 0.976	P= 0.068
MH	P= 0.439	P= 0.827	P= 0.890	P= 0.246	P= 0.789	P= 0.805	P= 0.366	*P= 0.048	P= 0.821
SF	P= 0.915	*P= 0.033	P= 0.478	P= 0.575	P= 0.320	P= 0.411	P= 0.182	P= 0.405	P= 0.482
BP	P= 0.741	P= 0.951	P= 0.445	P= 0.158	P= 0.397	P= 0.466	P= 0.354	P= 0.324	P= 0.155
GH	P= 0.234	P= 0.485	P= 0.516	P= 0.209	P= 0.888	P= 0.568	P= 0.350	P= 0.605	P= 0.190
*p< 0.05				**p< 0.01			***p< 0.001		

CAHPER SIX

DISCUSSION

6.1. General aspects

Improving QOL of stroke patients has received increasing interest during the last decade. QOL is difficult to measure objectively, but from the patient's point of view, it is the most important indication of outcome (Kaste 1998). The assessment of QOL should be multidimensional, including physical, social and role functioning, mental health and general health perceptions (Ware & Sherbourne 1992).

6.2. Evaluation post-stroke QOL

The aim of this study was to determine level of QOL among rehabilitated stroke survivors in Gaza strip, and to identify the most common factors influencing QOL among rehabilitated stroke survivors in Gaza Strip. In the present study researcher found that more than half of the study sample had good QOL in the patients suffering from deficits resulting from stroke assessed with the SF-36 the domain-specific. These results was suitable, supported with earlier study done by Hackett, (2000) which found that health-related quality of life appears to be relatively good for the majority of patients 6 years after stroke. And contrary of finding of other study which was done by Duncan, (1997) who found that health-related QOL, as measured by the time trade-off utility (TTO) and global utility indices, was lower for individuals with stroke.

This study shows that QOL were better in female than male in all domains of SF-36, with no significant gender differences in the domains of QOL, which found to be contrary of the study Kapral, (2005) which found that QOL were similar in women and men at 6 months after stroke. Carod-Artal, (2003) found that QOL was significantly much lower in women according to SF-36 score in all dimensions of this questionnaire. This could be explained by the role of the women in different community. Women in Palestinian and other Arabic countries plays a major role in raising children and taking care of the house, with less contact with her not domestic environment, and with no majority changing in QOL after impact of disease such as stroke, while men usually are the head of the family and the providers for its needs, working all day out of home, so they face problems while they are in home environment after onset of stroke, and so their QOL could be deteriorated.

The study results shows that younger stroke survivors had poorer QOL than older, but not statistically significant. The occurrence of new onset physical disability presents the patient with, not only a functional deficit, but also with physiologic emergency that affect individual's coping strategies, so the younger stroke survivors (age between 43-50) had the lowest of sample's number that reported good QOL, and the older stroke survivors (the other two groups) had the

highest number that reported good QOL, because they had passed cross all coping levels to acceptance unlike younger stroke survivors. But the results shows strongly statistically significant with educational level, higher educated individuals had better QOL than lower and not-educated stroke survivors. This could be explain by role of education in enhancing better understanding of disability and its impact on individuals life's after stroke. Our finding come in accordance with earlier study done by Nichols-Larsen (2005) which found that poorer HRQOL was associated with age, comorbidities, and reduced upper-extremity function. Carod-Artal, (2003) showed that neither educational level nor marital status influenced scoring of QOL assessed by SF-36.

In the present study, the researcher found that stroke survivors who lives in city were had better QOL score, and had better vitality scores than stroke survivors who lives outside city, with no significant place of residency differences in the domains of QOL. This disagrees with a study done by Sabbah (2003) using SF-36 to measure QOL of the in urban and rural general populations in Lebanon which found that patients resident in rural areas had higher vitality scores than those in urban areas. The difference could be explained by the difference in definition of urban and rural areas in different countries in which the result was conducted, and by the availability of medical and rehabilitation services in Gaza city more than outside Gaza city.

The higher percent of good QOL were in ischemic stroke in compared with recurrent and hemorrhagic stroke survivors, with no significant stroke type differences in the domains of QOL. This could be explaining by the minority of stroke survivors diagnosed as hemorrhagic, and severity of cognitive and speech dysfunctions related to hemorrhagic stroke. Sneeuw (1997) also found that QOL assessed by means of the Sickness Impact Profile (SIP) impairments were found for patients with supratentorial cortical or subcortical infarctions and hemorrhages than for patients with lacunar infarctions and infratentorial strokes.

Our finding revealed that stroke survivors with left-sided lesions had higher QOL than right-sided lesions stroke survivors, with no significant body side affects differences in the domains of QOL. This result related to brain hemisphere in relation of dominate of lift side of the brain which affects the right side of the body when having stroke, and it's symptoms are more severe of affecting the opposition body side. This finding come in accordance with earlier study done by De Haan, (1995), which found that there was slightly more QOL deterioration in patients with right-sided lesions.

In the present study, the researcher found that motor functional deficit within the affected body side and speech problems associated with low QOL supports the study done by Nichols-Larsen (2005) which found poorer quality of life was found in the areas of hand function, strength, and social participation with the highest

areas in memory and communication. It is noteworthy that motor functional deficit and speech problem associated with less independency in activities of daily living, and decrease social participation.

The study results shows that comorbidities factors were affected QOL, the researcher found that stroke survivors without hypertension, diabetes or heart disease were had lower QOL compared with stroke survivors without any comorbidities factors, this finding come in accordance with earlier study done by Nichols-Larsen (2005) which found that poorer HRQOL scores was associated with diabetes mellitus, and conclude that comorbidities of stroke survivors are important contributors to HRQOL. Also this finding come in accordance with study done by Agewall (1998) which found that a low self-estimated measure of quality of life was an independent predictor for stroke after more than 6 years of follow-up in treated hypertensive men. Although; epilepsy significantly affects outcome of stroke as health-related quality of life (QOL) (Camilo & Goldstein 2004). These comorbidities factors accompanied with health problems, which in turn affect individual's function and QOL.

6.3. QOL domains

The study results shows that most often poor QOL domains were role limitations due to physical health, physical function, role limitation due to emotional problems come in accordance with the results of an earlier study done by Anderson (1996) using the SF-36 as a measure of QOL. In one study Duncan (1997) patients with only mild disorders of stroke had lower QOL than the control group, contrary to another report (King 1996) in which patients were coping well with their stroke-related impairments.

In the present study, the researcher found that younger stroke survivors and educated stroke survivors had good QOL related to physical function and role limitation due to physical health, with significant age and level of education differences in the domains of QOL. This result supports earlier study obtained by Jonsson, (2005) to assessed stroke patients 4 months after stroke onset with the SF-36 questionnaire found a decrease of QOL in patients' in the domain physical function. And supports study which was done by Nichols-Larsen (2005) to examined the relationship of individual and clinical characteristics to HRQOL in stroke survivors which found that, age, gender, education level, stroke type, concordance (paretic arm=dominant hand), upper extremity motor function (Wolf Motor Function Test), and comorbidities were associated across SIS domains. Also Nichols-Larsen, 2005 found that older stroke survivors, nonwhites, and those with more comorbidities and lower upper-extremity function reported poorer HRQOL in the physical domain. Also supports study done by Duncan, (1997) found that Individuals with TIA were similar to those with mild stroke, except that they were less impaired in physical function and physical roles. And supports

earlier study which was conducted by Hopman & Verner, (2003) which showed that after discharge, role physical functioning continued to show statistically significant improvement.

This study results shows statistically significant in differences between level of education, place of residency and QOL related to vitality among rehabilitated stroke survivors, this results were contrary from results of earlier study conducted by Carod-Artal, (2003) which showed that QOL perceived by SF-36 was significantly much lower in women (P=0.0001); the main differences were observed in the subscales physical functioning, mental health, emotional role, and vitality, and the researcher of this study concluded that neither educational level nor marital status influenced scoring. And SF-36 vitality decreased slightly more in patients with post stroke depression.

Our finding revealed statistically significant in differences between level of education, place of residency, and with fewer deficits (facial palsy) associated with stroke. In follow up study obtained by Jonsson, (2005) to reevaluate QOL after stroke onset using SF-36 found increase in mental health (P=0.010), and mental component (P=0.001) compared with follow-up I.

The study results showed that less motor deficits significantly correlate with QOL related to social functioning ($p>0.05$). This result support earlier study done by Carod-Artal, (2003), which found that SF-36 social function was affected more in disabled than in depressed patients.

This study found that stroke survivors with less motor problems and hypertension were had better QOL related to role limitation due to physical health. This result comes in accordance with the earlier study which was done by Duncan, (1997) and found that individuals with TIA were similar to those with mild stroke, except that they were less impaired in physical function and physical roles and reported a higher incidence of pain. The study of Hopman & Verner, (2003) found that role limitation due to physical health continued to show statistically significant improvement after discharge from rehabilitation program

Also the in the present study, the researcher found that level of education and place of residency significantly correlate with QOL related to general health, and this support the result of earlier study done by Hackett, (2000) which found that institutional stroke had statistically lower mean scores than both the control group and New Zealand norms for physical functioning and general health after 6 years of onset of stroke.

6.4. QOL and functional status

Patients who had better functional status measured by FIM had significantly better QOL, this results come in accordance with finding of earlier study Indredavik, (1998) which found that patients who were independent in activities of daily living had significantly better QOL assessed by these scales than patients who were dependent. Also study of Kapral, (2005) found that women had a slightly worse functional status, as measured by the SIS-16, with a median score that was 6.3 points lower than that of men.

The correlation between age and QOL has remained obscure (Ahlsio 1984, Viitanen 1988, Astrom 1992, Wyller 1998). The present study showed an association between advanced age and low scores on the SF-36.

Reports concerning the correlation between dependency in ADL and QOL seem to have been contradictory, some reports showing a strong association (Ahlsio 1984, Niemi 1988), but others not (King 1996, Wyller 1998). Our finding revealed that dependency in ADL correlated only with QOL scores, and contrast with those of another study (Anderson1996) using the SF-36. Patients who were independent in activities of daily living had significantly better QOL assessed by these scales than patients who were dependent. (Indredavik 1998, Ahlsio, 1984) deterioration of QOL was more pronounced in ADL dependent patients than among the independent

Study conclusions

The present findings indicate that stroke affects physical component more than mental component. The following conclusions can be drawn from the present study:

1. More than half of stroke survivors had good QOL (55.6%), mental health was the best QOL domain, followed by general health, body pain, vitality, and social functioning. The poorer health was role limitation physical, followed by physical function, and role limitation emotional.

2. The higher percentage of stroke survivors with good QOL were female and older stroke survivors had better QOL than younger. Also stroke survivors who lives in Gaza city had better QOL than stroke survivors who lives outside Gaza city.

3. University educated and higher level educated stroke survivors had better QOL than low educated and not-educated stroke survivors, there were strong statistical significant differences between level of education and QOL among rehabilitated stroke survivors.

4. Ischemic stroke survivors had better QOL than recurrent and hemorrhagic stroke survivors. Comorbidities factors negatively affected QOL.

5. Age and level of education significantly affect physical function, and role limitation due physical health. Only severity of motor deficit significantly affect role limitation due physical health, and social functioning, also level of education and place of residency significantly affect vitality, mental health, and general health.

6. Functional status predict of QOL. According to FIM, independent stroke survivors had better QOL than dependent.

Study recommendations

The results of the present study emphasize the importance of multidimensional evaluations when considering the QOL of stroke patients. Such evaluations should not be limited to the present study, or for special target group. The findings also call for more individually tailored, multifaceted rehabilitative approaches including continuous and coordinated information, counseling and support, to improve the QOL of stroke patients.

The use of the SF-36 throughout the subacute stage of recovery specially, and all stages of rehabilitation generally may facilitate a better understanding of individual needs and, thereby, planning for programming during rehabilitation, and after discharge.

Future studies should focus on other but less clinically oriented aspects that might explain post-stroke QOL impairments, such as patients' living environment, social circumstances, and the use of and perceived need for healthcare services. These studies can help to further identify patients who are particularly prone to serious QOL deterioration. The availability of such risk profiles could in turn facilitate the development of community-based rehabilitative programs aimed at reducing the devastating effects of stroke and improving patients' QOL.

Future studies should involve normal population and stroke survivors for whom the possibility of comparison between them and stroke survivors regarded to QOL.

REFERENCES

Adams RD, Victor M, Ropper AH. (1997) Principles of Neurology 6th ed . New York: McGraw-Hill.

Addington-Hall J, Kalra L. Who should measure quality of life? *BMJ*. 2001; 322: 1417–1420.

Agewall S.; Wikstrand, J.; Fagerberg B., Stroke Was Predicted by Dimensions of Quality of Life in Treated Hypertensive Men ***Stroke.*** 1998;29:2329-2333.

Ahlsio B.; Britton M.; Murray V. and Theorell T**.,** Disablement and quality of life after stroke *Stroke*. 1984;15:886-890

Aho K, Harmsen P, Hataon S, Marquardsen J, Smirnow VE & Strasser T (1980) cerebrovascular disease in the community: results of a WHO Collaborative Study. *Bull World Health Organ* 58: 113-130.

Aljeesh Y.; Baune B.; Adrian I. Predictors of Quality Of Life among Hypertensive patients with and without Stroke *Journal of The Islamic University of Gaza (Natural Sciences Series)* 2005;13: 91-107.

American Heart Association (2007) Heart and Stroke Statistical Update. Dallas: American Heart Association, 2007.

Anderson C.; Rubenach S.; Mhurchu C.; Clark M.; Spencer C.; Winsor A., Home or Hospital for Stroke Rehabilitation? Results of a Randomized Controlled Trial *Stroke*. 2000;31:1024-1031

Anderson G., Laubscher S., Burns R., Validation of the Short Form 36 (SF-36) Health Survey Questionnaire Among Stroke Patients. ***Stroke.*** 1996;27:1812-1816.

Anderson G., Carter K., Brownlee. Hackett M., Broad J., Bonita R., Very Long-Term Outcome after Stroke in Auckland, New Zealand. *Stroke*. 2004;35:1920.

Angeleri F.; Angeleri VA.; Foschi N.; Giaquinto S. and Nolfe G., The influence of depression, social activity, and family stress on functional outcome after stroke *Stroke*. 1993;24:1478-1483

Aronson AE. (1990) Clinical Voice Disorders 3rd ed. New York: Thieme Medical Publishers.

Assessment Methods for Stroke Patients. (1996) In: AHCPR Post-Stroke Rehabilitation: Clinical Practice Guidelines. Aspen Publishers.

Astrom M, Adolfsson R & Asplund K (1993) Major depression in stroke patients. A 3-year longitudinal study. *Stroke* 24: 976-982.

Bagg S.; Pombo A.; Hopman W., Effect of Age on Functional Outcomes After Stroke Rehabilitation *Stroke.* 2002;33:179-185

Biller J, Bruno A. (1997) "Acute Ischemic Stroke" in Current Therapy in Neurologic Disease 5th ed . St. Louis: Mosby.

Black-Schaffer RM, Kirsteins AE, Harvey RL. Stroke rehabilitation. 2. Co-morbidities and complications. *Arch Phys Med Rehabil* 1999; 80(suppl): S8-16.

Bobath B. Adult hemiplegia: Evaluation and treatment . London: Spottiswood Ballintype, 1978.

Bonomi, A. E., Patrick, D. L., Bushnell, D. M., & Martin, M. (2000). Validation of the United States' version of the World Health Organization Quality of Life (WHOQOL) instrument. *Journal of Clinical Epidemiology, 53*, 19–23.

Braddom R. (2000) Physical Medicine and Rehabilitation 2ed edition W. B. Saunders Company U.S.A.

Brandt EN, Pope AM. Enabling America (1997): Assessing the role of rehabilitation science and engineering. Washington, D.C.: National Academy Press.

Brunnstrom S. Motor testing procedures in hemiplegia: based on sequential recovery stages. *Phys Ther* 1966; 46: 357-75.

Brunnstrom S. (1970) Movement Therapy in Hemiplegia: A Neurophysiological Approach. New York: Medical Dept., Harper & Row.

Bugge C, Hagen S, Alexander H. Measuring stroke patients' health status in the early post-stroke phase using the SF36. *Int J Nurs Stud*. 2001; 38: 319–32

Burn J, Dennis M, Bamford J, Sandercock P, Wade D, Warlow C. Epileptic seizures after a first stroke: the Oxfordshire Community Stroke Project. *BMJ* 1997;315:1582–7.

Camilo O.; Goldstein L., Seizures and Epilepsy After Ischemic Stroke *Stroke.* 2004;35:1769

Carod-Artal J., Egido JA., González JL., De Seijas V., Quality of Life Among Stroke Survivors Evaluated 1 Year After Stroke. *Stroke.* 2003;31:2995.

Carr JH, Shepherd RB, Nordholm L, Lynne D. Investigation of a new motor assessment scale for strokepatients. *Phys Ther*. 1985;65:175–80.

Clarke p., Marshall v., Black S., Colantonio A., Well-Being after Stroke in Canadian Seniors. *Stroke.* 2002; 33:1016

Charle H. & Carolyn M., (1997) Occupational therapy: Enabling Function and Well-Being, second edition, SLACK Incorporated, U.S.A.

Coffey E.; Cummings L.; Starkstein S.; Robinson R.; (2000). Stroke - The American Psychiatric Press Textbook of Geriatric Neuropsychiatry, Second Edition, Washington DC: *American Psychiatric Press*, 601–617

Cuccurullo S., Physical Medicine and Rehabilitation, (2004), Demos Medical Publishing U.S.A.

Elle kjaer EF.; Wyller TB.; Sverre JM. and Holmen J., Lifestyle factors and risk of cerebral infarction *Stroke.* 1992;23:829-834

Elliot J., Roth M.D., and Harvey R., (2000) Rehabilitation of Stroke Syndromes-Physical Medicine and Rehabilitation, 2ed edition, W.B. saunders company, U.S.A.

Deborah S., Clark P.C., Zeringue A., Greenspan A. Factors Influencing Stroke Survivors' Quality of Life During Subacute Recovery. *Stroke.* 2005;36:1480.

De Haan RJ, Limburg M, Van der Meulen JHP. Quality of life after stroke. *Stroke.* 1995;26:402-408.

De Haan R, Horn J, Limburg M, et al. A comparison of five stroke scales with measures of disability, handicap, and quality of life. *Stroke*. 1993;24:1178-1181.

Deutsch A.; Granger C.; Heinemann A.; Fiedler R.; DeJong G.; Kane R.; Ottenbacher K.; Naughton J., Poststroke Rehabilitation : Outcomes and Reimbursement of Inpatient Rehabilitation Facilities and Subacute Rehabilitation Programs *Stroke.* 2006;37:1477

Duncan P, Samsa G, Weinberger M, et al. Health status of individuals with mild stroke. *Stroke*. 1997;28:740-745.

Engstrom G.; Jerntorp I.; Rasmussen H.; Hedblad B.; Berglund G.; Janzon L., Geographic Distribution of Stroke Incidence Within an Urban Population *Stroke.* 2001;32:1098.

Feigenson JS, McDowell FH, Meese P, McCarthy ML and Greenberg SD Factors influencing outcome and length of stay in a stroke rehabilitation unit. Part 1. Analysis of 248 unscreened patients-- medical and functional prognostic indicators *Stroke*. 1977;8: 651-656

Ferri, FF. (1998) Practical Guide to the Care of the Medical Patient 4th ed . St. Louis: Mosby.

Gibbs R.; Newson R.; Lawrenson R.; Greenhalgh R.; Davies A., Diagnosis and Initial Management of Stroke and Transient Ischemic Attack Across UK Health Regions From 1992 to 1996 *Stroke.* 2001;32:1085.

Gillen G., Burkhardt A., (2004) Stroke Rehabilitation- A Function-Based Approach second edition, Mosby, Inc.

Gordon C, Hewer RL, Wade DT. Dysphagia in acute stroke. *Br Med J (Clin Res Ed)*. 1987;295:411–4.

Granger C., Hamilton,B. , Linacre, J., Heinmam, A. & Wright, B., (1993). Performance profiles of the Functional Independent Measure. *American Journal of Physical Medicine and Rehabilitation* 70, 100-103.

Gresham GE.; Alexander D.; Bishop D; Giuliani C.; Goldberg G.; Holland A.; Kelly-Hayes; Linn R.; Roth E.; Stason W.; Trombly C., Rehabilitation *Stroke.* 1997;28:1522-1526.

Gresham GE. Past achievements and new directions in stroke outcome research. *Stroke*. 1990;21(suppl 2):II-1-II-2.

Gresham SL. Clinical assessment and management of swallowing difficulties after stroke. *Med J Aust* 1990;153:397–99.

Guide (1993) Guide for the Uniform Data Set for medical rehabilitation for children (Wee FIM). Version 4.0 Buffalo, NY: State University of New York at Buffalo.

Guide (1993). Guide for the Uniform Data Set for medical rehabilitation (Adult FIM). Version 4.0 Buffalo, NY: State University of New York at Buffalo.

Haan RJ, Limburg M, Van der Meulen JHP. Quality of life after stroke. *Stroke.* 1995;26:402-408.

Hackett ML, Duncan JR, Anderson CS., Health-related quality of life among long-term survivors of stroke: results from the Auckland Stroke Study. *Stroke*: 2000;31:440-447.

Hamilton B. B., Laughlin J. A., Fiedler R. C., & Granger C. V., (1994). Interrater reliability of the 7-level Functional Independent Measure. *Scandinavian Journal of Rehabilitation Medicine*, 26, 115-119.

Hajat C.; Dundas R.; Stewart J.; Lawrence E.; Rudd A..; Howard R., Wolfe C. Cerebrovascular Risk Factors and Stroke Subtypes *Stroke.* 2001;32:37

Hopman W., Verner J., Quality of Life During and After Inpatient Stroke Rehabilitation. *Stroke*: 2003;34:801.

Harold A.; Robert A.; Del Zoppo G.; Goldstein B., Guidelines for the Early Management of Patients With Ischemic Stroke *Stroke*. 2005;36:916

Hayes V, Morris J, Wolfe C, Morgan M. The SF-36 health survey questionnaire: is it suitable for use with older adults? *Age Aging*. 1995; 24: 120–125

Indredavik B.; Bakke F.; Slordahl S.; Rokseth R.; Haheim L., Stroke Unit Treatment Improves Long-term Quality of Life *Stroke.* 1998;29:895-899.

Indredavik B.; Slordahl S.; Bakke F.; Rokseth R.; Haheim L., Stroke Unit Treatment: Long-term Effects *Stroke.* 1997;28:1861-1866.

Jenkinson, C., Wright, L., & Coulter, A. (1994). Criterion validity and reliability of the SF-36 in population sample. *Quality of life research*, 3 7-12

John E. SF-36 Health Survey Update *Spine* (2000); 25:24; 3130–3139. Lippincott Williams & Wilkins, Inc.

Jonkman EJ, de Weerd AW, Vrijens NLH. Quality of life after a first ischemic stroke. *Acta Neurologica Scandinavia*. 1998;98:169-175.

Jonsson A.; Lindgren I.; Hallström B.; Norrving B.; Lindgren A. Determinants of Quality of Life in Stroke Survivors and Their Informal Caregivers .*Stroke.* 2005;36:803.

Kalra L.; Yu G.; Wilson K.; Roots P., Medical Complications During Stroke Rehabilitation *Stroke.* 1995;26:990-994.

Kapral M., Fang J.,. Hill M., Silver F., Richards J., Jaigobin C., Cheung A., Sex Differences in Stroke Care and Outcomes. *Stroke.* 2005;36:809.

Kaste M, Fogelholm R & Rissanen A (1998) Economic burden of stroke and the evalution of new therapies. *Public Health* 112: 103-112.

Kelly P.; Stein J.; Shafqat S.; Eskey C.; Doherty D.; Chang Y.; Kurina A.; Furie K., Functional Recovery After Rehabilitation for Cerebellar Stroke *Stroke.* 2001;32:530-534

King R. Quality of life after stroke. *Stroke*. 1996;27:1467-1472.

Kothari R.; Brott T.; Broderick J.; Hamilton C., Emergency Physicians : Accuracy in the Diagnosis of Stroke *Stroke.* 1995;26:2238-2241.

Kirsteins AE, Black-Schaffer RM, Harvey RL. Stroke rehabilitation: 3. Rehabilitation management. *Arch Phys Med Rehabil* 1999; 80(suppl): 17-20.

Knott M, Voss DE. (1968) Proprioceptive Neuromuscular Facilitation: Patterns and Techniques, 2nd ed . Hagerstown: Harper and Row.

Kwa VI., Limburg M, de Haan RJ. The role of cognitive impairment in the quality of life after ischaemic stroke. *Stroke*. 1996;243(8):599-604.

Lawrence L & Christie D. Quality of Life after Stroke: A three-Year follow-up *Oxford Journals- Age and Aging* 1979;8-3: 167-172

Liebetrau M.; Steen B.; Skoog I., Stroke in 85-Year-Olds : Prevalence, Incidence, Risk Factors, and Relation to Mortality and Dementia *Stroke*. 2003;34:2617.

Lofgren B., Gustafson Y., Nyberg L., Psychological Well-Being 3 Years After Severe Stroke. *Stroke*. 1999;30:567-572.

Logemann JA. Approaches to management of disordered swallowing. *Baillieres Clin Gastroenterol*. 1991;5:269–80.

McColl, M. A., & Fridland, J (1989). Social support. Aging and disability. *Topics in Geriatric Rehabilitation*, 9, 54-71. From: Charle H. & Carolyn M., Occupational therapy: Enabling Function and Well-Being, second edition, (1997) SLACK Incorporated, U.S.A.

McColl, M. A., & Rosenthal, C. (1994). A model of resource needs of aging spinal cord injury men. *Paraplegia*, 32, 261-270. From: Charle H. & Carolyn M., Occupational therrapy: Enabling Function and Well-Being, second edition, (1997) SLACK Incorporated, U.S.A.

McCullagh E.; Brigstocke G.; Donaldson N.; Kalra L., Determinants of Caregiving Burden and Quality of Life in Caregivers of Stroke Patients *Stroke.* 2005;36:2181.

McGruder H.; Croft J.; Zheng Z., Characteristics of an "Ill-Defined" Diagnosis for Stroke : Opportunities for Improvement *Stroke*. 2006;37:781.

Ministry Of Health (MOH), Health Status in Palestine, Annual Report 2004, Gaza, Palestine , Aug. 2005.

Movimiento por la Paz, el Desarme y la Libertad (MPDL), Report of findings from the Screening and Registration of Disabled in the Northern and Middle Areas of the Gaza Strip, October 2002.

Movimiento por la Paz, el Desarme y la Libertad (MPDL), Report of findings from the Screening and Registration of Disabled in Gaza City, May 2003.

Niemi M., Laaksonen R., et al. Quality of life 4 years after stroke. *Stroke.* 1988;19:1101-1107.

Noll SF, Bender CE, Nelson MC. (1996) Rehabilitation of Patients With Swallowing Disorders. In Braddom RL. Physical Medicine and Rehabilitation . Philadelphia: W.B. Saunders Co.

Paul S., Sturm J., Dewey H., Donnan G., Macdonell R., Thrift A., Long-Term Outcome in the North East Melbourne Stroke Incidence Study - Predictors of Quality of Life at 5 Years After Stroke. *Stroke.* 2005;36:2082.

Ottenbacher K. J., Mann W. C., Granger C. V., Tomita M., Hurren D., Charvat B., Interreter agreement and stability of functional assessment in the community based elderly. *Archives of Physical Medicine and Rehabilitation*, 75, 1297-1301.

Reith J, Jorgensen HS, Nakayama H, Raaschou HO, Olsen TS. Seizures in acute stroke: predictors and prognostic significance. The Copenhagen Stroke Study. *Stroke* 1997;28:1585–9.

Rosen P., (1992) Emergency Medicine—Stroke 3rd ed . St. Louis: Mosby.

Roth E.; Lovell L.; Harvey R.; Heinemann A.; Semik P., Diaz B., Incidence of and Risk Factors for Medical Complications During Stroke Rehabilitation *Stroke.* 2001;32:523-529

Roth EJ. Medical rehabilitation of the stroke patient. *Be Stroke Smart: National Stroke Association Newsletter.*. 1992;8:8.

Sabbah I., Drouby N., Sabbah S., Retel-Rude N., and Mercier M. Quality of Life in rural and urban populations in Lebanon using SF-36 Health Survey *Health Qual Life Outcomes*. 2003; 1: 30.

Samsa GP, Reutter RA, Parmigiani G, Ancukiewicz M, Abrahamse P, Lipscomb J, et al. Performing cost-effectiveness analysis by integrating randomized trial data with a comprehensive decision model: application to treatment of acute ischemic stroke. *J Clin Epidemiol*. 1999;52:259

Sawner KA, LaVigne JM. Brunnstrom's (1992) Movement Therapy in Hemiplegia: A Neurophysiological Approach, 2nd ed . Philadelphia: J.B. Lippincott.

Senelick C.; Peter W.; Dougherty K., (1994). Living with Stroke: A Guide For Families. Contemporary Books, Chicago

Sneeuw KCA., Aaronson NK., Assessing quality of life after stroke. *Stroke*.1997;28:1541-1549.

Stewart DG. Stroke rehabilitation: 1. Epidemiologic aspects and acute management. *Arch Phys Med Rehabil* 1999; 80(suppl): 4-7.

Stewart, A., & Ware, J. E. (1992). Measuring functional and well-being: the medical outcomes study approach. *Durham, NC: Duke University Press.*

Stineman MG. Defining the population, treatments, and outcomes of interest: reconciling the rules of biology with meaningfulness. *American Journal of Physical Medicine & Rehabilitation* 2001; 80(2):147-159.

Studenski S.; Duncan P.; Perera S.; Reker D.; Lai S.; Richards L., Daily Functioning and Quality of Life in a Randomized Controlled Trial of Therapeutic Exercise for Subacute Stroke Survivors *Stroke.* 2005;36:1764

Sturm J.; Dewey H.; Donnan G.; Macdonell R.; McNeil J., Thrift A., Handicap After Stroke: How Does It Relate to Disability, Perception of Recovery, and Stroke Subtype? *Stroke.* 2002;33:762

Sturm J.; Osborne R.; Dewey H.; Donnan G.; Macdonell R.; Thrift A., Brief Comprehensive Quality of Life Assessment After Stroke: The Assessment of Quality of Life Instrument in the North East Melbourne Stroke Incidence Study (NEMESIS) *Stroke.* 2002;33:2888.

Tengs T.; Yu M.;. Luistro E, Health-Related Quality of Life After Stroke A Comprehensive Review *Stroke.* 2001;32:964.

Twitchell TE. The restoration of motor function following hemiplegia in man. *Brain* 1951; 74: 443-80.

Ware JE & Sherbourne CD (1992) The MOS 36-Item Short Form Health Survey (SF-36) I. Conceptual framework and item selection. *Med Care* 30: 473-483.

WHOQOL Group. (1994). The development of the World Health Organization Quality of Life Assessment Instrument (the WHOQOL). In J. Orley & W. Kuyken (Eds.), *Quality of life assessment: International perspectives.* Berlin: Springer-Verlag.

WHOQOL Group. (1995). The World Health Organization Quality of Life Assessment (WHOQOL): Position paper from the World Health Organization. *Social Science and Medicine, 41*, 1403–1409.

WHO Task force on stroke and other cerebrovascular disorders: stroke-1989. Recommendations on stroke prevention, diagnosis, and therapy. *Stroke*. 1989; 20:1407-1431

Williams LS., Weinberger M., et al. Measuring quality of life in a way that is meaningful to stroke patients. *Neurology*. 1999;53:1839-1843.

Williams S., Weinberger M, Harris LE, et al. Development of a stroke-specific quality of life scale. *Stroke*. 1999;30:1362-1369.

Wolf PA., D'Agostino RB., O'Neal MA., Sytkowski P., Kase CS,. Belanger AJ., Kannel WB.. Secular trends in stroke incidence and mortality: the Framingham Study. *Stroke*.. 1992;23:1551-1555.

Wyller TB, Holmen J, Laake P & Laake K (1998) Correlates of subjective well-being in stroke patients. *Stroke* 29: 363-367.

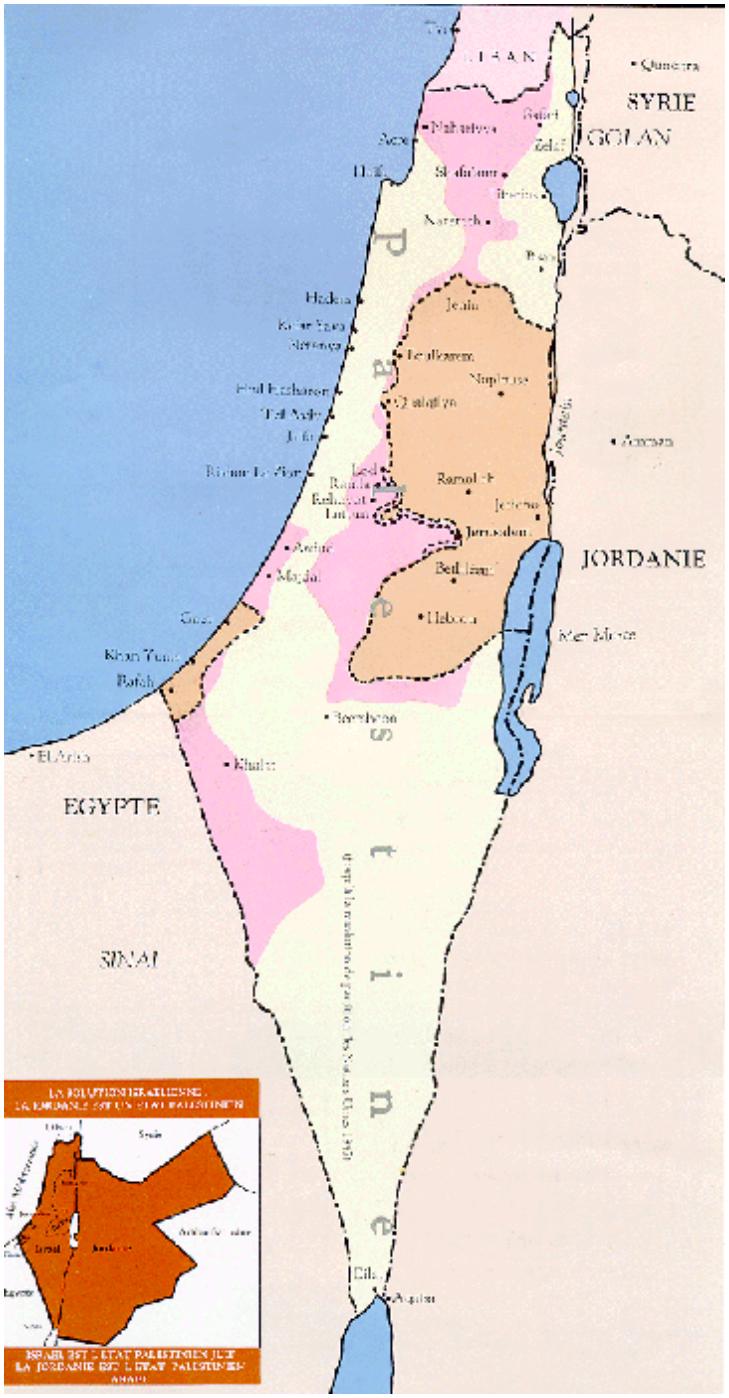
Villarosa, L.; Singleton L.; Johnson A., (1993). Black Health Library Guide to Stroke. Henry Holt and Company, New York

Viitanen M, Fugl-Meyer KS, et al. Life satisfaction in long-term survivors after stroke. *Scandinavian Journal of Rehabilitation Medicine*. 1988;20:17-24.

APPENDIXES

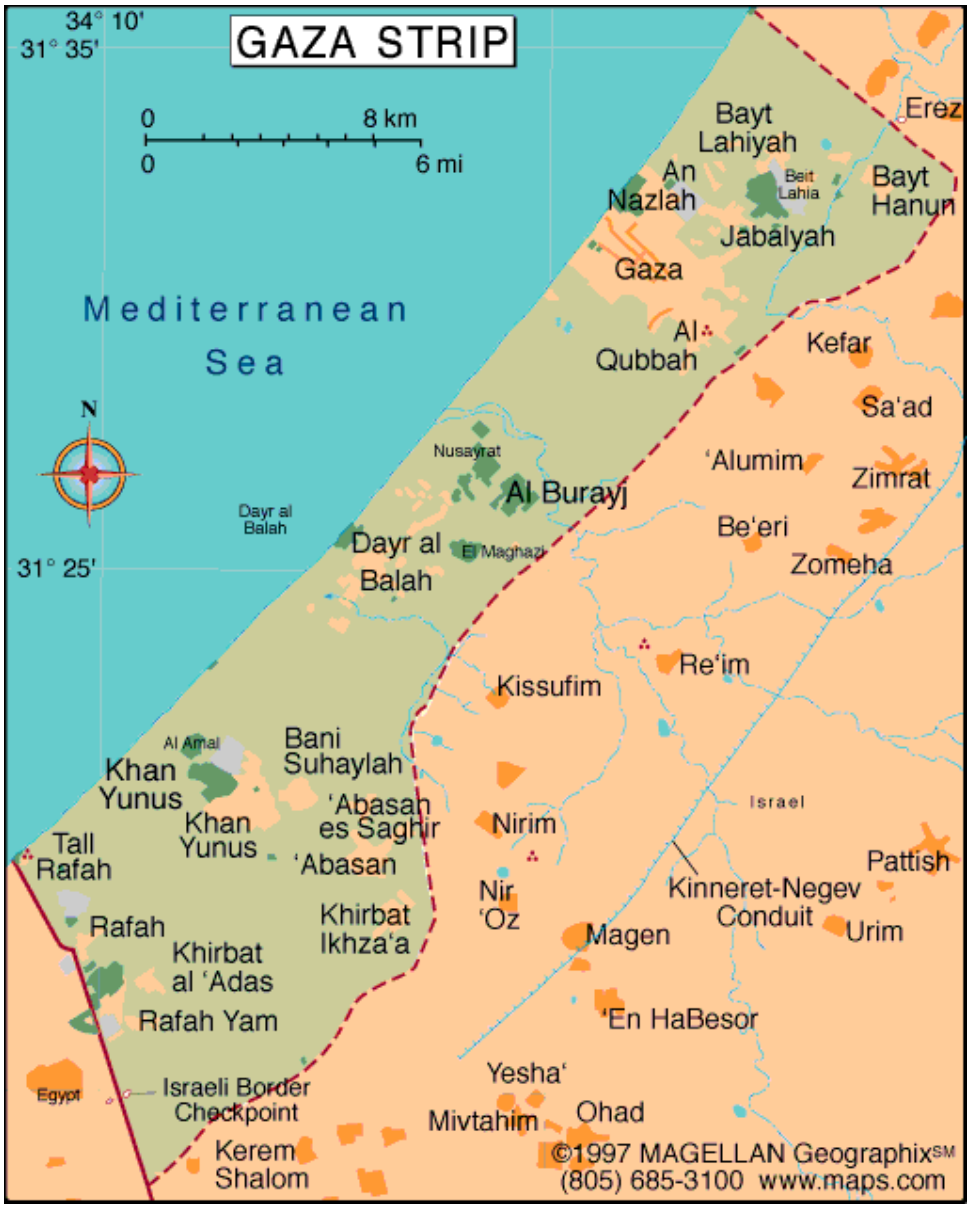
Appendix (1)

Map of Palestine



Appendix (2)

Map of Gaza strip



Appendix (3)

Ethical approval letter to El-Wafa medical rehabilitation Hospital

بسم الله الرحمن الرحيم

الجامعة الإسلامية – غزة
The Islamic University - Gaza

عمادة الدراسات العليا
Ref. الرقم ج س غ/35/
Date التاريخ 2007/11/19

هاتف داخلي: 1150

الأخ الأستاذ/ تيسير البلتاجي حفظه الله،
مدير عام مستشفى الوفاء للتأهيل الطبي
السلام عليكم ورحمة الله وبركاته،

الموضوع/ تسهيل مهمة طالب ماجستير

تهديكم عمادة الدراسات العليا بالجامعة الإسلامية أعطر تحياتها، وترجو من سيادتكم التكرم بتسهيل مهمة الطالب/ فؤاد محمد فؤاد لظن برقم جامعي 2004/4846 المسجل في برنامج الماجستير بكلية التربية تخصص الصحة النفسية المجتمعية/علوم التأهيل، وذلك بهدف الحصول على المعلومات التي تساعده في إعداد بحث بعنوان:

"جودة الحياة عند مرضى الجلطة الدماغية الذين تلقوا برنامج تأهيل بقطاع غزة"

والله ولي التوفيق،،،

عميد الدراسات العليا

د. مازن إسماعيل هنية

صورة إلى:-
❖ الملف.

ص.ب 108 الرمال غزة فلسطين تلفون tel: +970 (8) 286 0700 فاكس +970 (8) 286 0800
public@iugaza.edu.ps www.iugaza.edu.ps

Appendix (4)

استبيان صحي

الجنس **o** ذكر **o** أنثى
العمر: ..... سنة
المؤهل العلمي **o** ابتدائي **o** إعدادي **o** ثانوي **o** بكالوريوس **o** ماجستير **o** دكتوراه

	تعليمات المسح الصحي (SF36) : من فهلك أجب على كل الأسئلة الموجودة في هذا الاستبيان، أرجو اختيار أقرب إجابة لفهمك للسؤال
١	بصور عامة: كيف ترى حالتك الصحية؟ (أختر إجابة واحدة، و ضع علامة **ü** أمام الإجابة المناسبة) **o** ممتازة **o** جيدة جداً **o** جيدة **o** لا بأس بها **o** سيئة
٢	مقارنة بعام مضى، كيف تقييم حالتك الصحية الآن بصورة عامة؟ (أختر إجابة واحدة، و ضع علامة **ü** أمام الإجابة المناسبة) **o** أفضل بكثير مما كانت علية قبل عام **o** أفضل نوعاً ما من العام الماضي **o** تقريبا على ما هي علية **o** أسوأ نوعاً ما من العام الماضي **o** أسوأ بكثير مما كانت علية قبل عام

تتعلق البنود التالية بأنشطة يمكن أن تقوم بها خلال يومك العادي. في الوقت الحالي، إلى أي مدى تقيدك حالتك الصحية؟ (أختر إجابة واحدة، و ضع علامة **ü** على مربع الإجابة المناسبة)

	الأنشطة	نعم تقيدني كثيراً	نعم تقيدني قليلاً	لا تقيدني إطلاقاً
٣	**من ممارسة الأنشطة الشاقة،** مثل الجري، حمل الأشياء الثقيلة، ممارسة الأنشطة الرياضية المجهدة جداً ؟	**o**	**o**	**o**
٤	**من ممارسة الأنشطة متوسطة الجهد،** كتحريك الطاولة، أو التنظيف باستخدام المكنسة الكهربائية، أو تنظيف حديقة المنزل و العناية بها؟	**o**	**o**	**o**
٥	من حمل المشتريات من البقالة أو السوبر ماركت؟	**o**	**o**	**o**
٦	من صعود الدرج لعدة أدوار؟	**o**	**o**	**o**
٧	من صعود الدرج لدور واحد فقط؟	**o**	**o**	**o**
٨	من الانحناء، الركوع، أو السجود؟	**o**	**o**	**o**
٩	من المشي لأكثر من كيلومتر و نصف؟	**o**	**o**	**o**
١٠	من المشي لمسافة نصف كيلومتر؟	**o**	**o**	**o**
١١	من المشي لمسافة مئة متر؟	**o**	**o**	**o**
١٢	من الاستحمام أو ارتداء الملابس بنفسك؟	**o**	**o**	**o**

تتعلق البنود التالية بالمشاكل التي يمكن أن تواجهك خلال تأديتك لعملك أو للأنشطة اليومية المعتادة نتيجة لحالتك الصحية الجسمية خلال الأربع أسابيع الماضية. هل تسببت حالتك الصحية الجسمية في؟ (أختر إجابة واحدة، و ضع علامة **ü** على مربع الإجابة المناسبة)

		نعم	لا
١٣	التقليل من الوقت الذي تقضية في العمل أو أنشطة أخرى؟	**o**	**o**
١٤	التقليل مما تود انجازه من العمل أو أي أنشطة أخرى؟	**o**	**o**

		نعم	لا
١٥	تقيدك في أداء نوع معين من الأعمال أو أي أنشطة أخرى؟	o	o
١٦	أن تجد صعوبة في تأدية العمل أو أي أنشطة أخرى (على سبيل المثال: تأخذ منك جهد إضافي لتأديتها)	o	o

تتعلق البنود التالية بالمشاكل التي يمكن أن تواجهك خلال تأديتك لعملك أو للأنشطة اليومية المعتادة نتيجة لحالتك الصحية النفسية (مثل الشعور بالاكتئاب أو القلق) خلال الأربع أسابيع الماضية. هل تسببت حالتك الصحية الجسمية في؟
(أختر إجابة واحدة، و ضع علامة ü على مربع الإجابة المناسبة)

		نعم	لا
١٧	التقليل من الوقت الذي تقضية في العمل أو أنشطة أخرى؟	o	o
١٨	التقليل مما تود انجازه من العمل أو أي أنشطة أخرى؟	o	o
١٩	عدم انجاز العمل أو أي أنشطة أخرى بالحرص المعتاد؟	o	o

٢٠	خلال ٤ أسابيع الماضية، إلى أي مدى تعارضت صحتك الجسمية و النفسية مع تأديتك لنشاطاتك الاجتماعية المعتادة مع عائلتك أو أصدقائك أو جيرانك أو المناسبات الاجتماعية الأخرى؟ (أختر إجابة واحدة، و ضع علامة ü أمام الإجابة المناسبة) o لم يكن هناك أي تعارض إطلاقا o كان هناك تعارض قليل o كان هناك تعارض متوسط o كان هناك تعارض كبير o كان هناك تعارض كبير جداً
٢١	ما شدة الألم الجسمي الذي عانيت منة خلال الأسابيع الأربع الماضية؟ (أختر إجابة واحدة، و ضع علامة ü أمام الإجابة المناسبة) o لم يكن هناك أي ألم o كان هناك ألم خفيف جداً o كان هناك ألم خفيف o كان هناك ألم متوسط o كان هناك ألم شديد o كان هناك ألم شديد جداً
٢٢	خلال الأسابيع الأربع الماضية ، إلى أي مدى أدى الألم الجسمي إلى التعارض مع تأديتك لأعمالك المعتادة (سواء داخل المنزل أو خارجة)؟ (أختر إجابة واحدة، و ضع علامة ü أمام الإجابة المناسبة) o لم يكن هناك أي تعارض o كان هناك تعارض قليل o كان هناك تعارض متوسط o كان هناك تعارض كبير o كان هناك تعارض كبير جداً

الأسئلة التالية تتعلق بكيفية شعورك و طبيعة سير الأمور معك خلال الأسابيع الأربع الماضية ، الرجاء إعطاء إجابة لكل سؤال بحيث تكون هذه الإجابة هي الأقرب إلى الحالة التي كنت تشعر بها خلال الأسابيع الأربع الماضية. كم من الوقت؟
(أختر إجابة واحدة، و ضع علامة ü على مربع الإجابة المناسبة)

		في كل الأوقات	في معظم الأوقات	في كثير من الأوقات	في بعض الأوقات	في قليل من الأوقات	لم أشعر في أي من الأوقات
٢٣	شعرت بأنك ملئ بالحيوية و النشاط ؟	o	o	o	o	o	o
٢٤	كنت شخصا عصبيا جداً؟	o	o	o	o	o	o
٢٥	شعرت بأنك في حالة اكتئاب إلى درجة لم يمكن معها إدخال السرور إليك؟	o	o	o	o	o	o

		في كل الأوقات	في معظم الأوقات	في كثير من الأوقات	في بعض الأوقات	في قليل من الأوقات	لم أشعر في أي من الأوقات
٢٦	شعرت بالهدوء و الطمأنينة؟	o	o	o	o	o	o
٢٧	كانت لديك طاقة كبيرة؟	o	o	o	o	o	o
٢٨	شعرت بالإحباط و اليأس؟	o	o	o	o	o	o
٢٩	شعرت بأنك منهك (استنفذت قواك)؟	o	o	o	o	o	o
٣٠	شعرت بأنك شخص سعيد؟	o	o	o	o	o	o
٣١	شعرت بأنك تعبان؟	o	o	o	o	o	o

٣٢ خلال الأسابيع الأربع الماضية ، ما مقدار الوقت الذي تعارضت فيه صحتك الجسمية أو مشاكلك الاجتماعية مع نشاطاتك الاجتماعية (مثل زيارة الأصدقاء و الأقارب و غير ذلك)؟ (أختر إجابة واحدة، و ضع علامة **ü** أمام الإجابة المناسبة)

- **o** كان التعارض في كل الأوقات
- **o** كان التعارض في معظم الأوقات
- **o** كان التعارض في بعض الأوقات
- **o** كان التعارض في قليل من الأوقات
- **o** لم يكن هنالك تعارض في أي من الأوقات

ما مدي صحة أو خطأ العبارات التالية بالنسبة إلى حالتك الصحية؟ (أختر إجابة واحدة، و ضع علامة **ü** على مربع الإجابة المناسبة)

		صحيحة بلا شك	صحيحة غالبا	لا أعلم	خطأ غالبا	خطأ بلا شك
٣٣	يبدو أنني أصاب بالمرض أسهل من الآخرين	o	o	o	o	o
٣٤	حالتي الصحية مساوية لأي شخص أعرفه	o	o	o	o	o
٣٥	أتوقع أن تسوء حالتي الصحية	o	o	o	o	o
٣٦	حالتي الصحية ممتازة	o	o	o	o	o

* * * * * * شكراً لتعاونكم * * * * * *

الباحث

Appendix (5)

SF36 Health Survey. INSTRUCTIONS: This set of questions asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Answer every question by marking the answer as indicated. If you are unsure about to answer a question please give the best answer you can.

1.	In general, would you say your health is: (Please tick **one** box.) Excellent – Very Good – Good – Fair – Poor –			
2.	Compared to one year ago, how would you rate your health in general now? (Please tick **one** box.) Much better than one year ago – Somewhat better now than one year ago – About the same as one year ago – Somewhat worse now than one year ago – Much worse now than one year ago –			
	The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much? **(Please circle one number on each line.)**			
	Activities	**Yes, Limited A Lot**	**Yes, Limited A Little**	**Not Limited At All**
3.	**Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	1	2	3
4.	**Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
5.	Lifting or carrying groceries	1	2	3
6.	Climbing **several** flights of stairs	1	2	3
7.	Climbing **one** flight of stairs	1	2	3
8.	Bending, kneeling, or stooping	1	2	3
9.	Waling **more than a mile**	1	2	3
10.	Walking **several blocks**	1	2	3
11.	Walking **one block**	1	2	3
12.	Bathing or dressing yourself	1	2	3
	During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health? **(Please circle one number on each line.)**			

		YES	NO
13.	Cut down on the **amount of time** you spent on work or other activities	1	2
14.	Accomplished less than you would like	1	2
15.	Were **limited** in the **kind** of work or other activities	1	2
16.	Had **difficulty** performing the work or other activities (for example, it took extra effort)	1	2
	During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?		
	(Please circle one number on each line.)	**Yes**	**No**
17.	Cut down on the **amount of time** you spent on work or other activities	1	2
18.	Accomplished less than you would like	1	2
19.	Didn't do work or other activities as **carefully** as usual	1	2
20	During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups? (Please tick **one** box.) Not at all – Slightly – Moderately – Quite a bit – Extremely –		
21.	How much physical pain have you had during the past 4 weeks? (Please tick **one** box.) None – Very mild – Mild – Moderate – Severe – Very Severe –		
22.	During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)? (Please tick **one** box.) Not at all – A little bit – Moderately – Quite a bit – Extremely –		
	These questions are about how you feel and how things have been with you during the past 4 weeks. Please give the one answer that is closest to the way you have been feeling for each item.		

	(Please circle one number on each line.)	**All of the Time**	**Most of the Time**	**A Good Bit of the Time**	**Some of the Time**	**A Little of the Time**	**None of the Time**
23.	Did you feel full of life?	1	2	3	4	5	6

24.	Have you been a very nervous person?	1	2	3	4	5	6
25.	Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
26.	Have you felt calm and peaceful?	1	2	3	4	5	6
27.	Did you have a lot of energy?	1	2	3	4	5	6
28.	Have you felt downhearted and blue?	1	2	3	4	5	6
29.	Did you feel worn out?	1	2	3	4	5	6
30.	Have you been a happy person?	1	2	3	4	5	6
31.	Did you feel tired?	1	2	3	4	5	6
32.	During the <u>past 4 weeks</u>, how much of the time has your <u>physical health or emotional problems</u> interfered with your social activities (like visiting with friends, relatives etc.) (Please tick **one** box.) All of the time – Most of the time – Some of the time – A little of the time – None of the time –						
	How TRUE or FALSE is <u>each</u> of the following statements for you?						
	(Please circle one number on each line.)	**Definitely True**	**Mostly True**	**Don't Know**	**Mostly False**	**Definitely False**	
33.	I seem to get sick a little easier than other people	1	2	3	4	5	
34.	I am as healthy as anybody I know	1	2	3	4	5	
35.	I expect my health to get worse	1	2	3	4	5	
36.	My health is excellent	1	2	3	4	5	

Appendix (6)

Functional assessment and outcome measures for the rehabilitation health professional

FIM[SM] instrument

LEVELS	7 Complete independence (timely, safely) 6 Modified independence (device)	NO HELPER
	Modified dependence 5 supervision 4 Minimal assist (subject = 75% +) 3 moderate assist (subject = 50% +) Complete dependence 2 Maximal assist (subject = 25% +) 1 Total assist (subject = 0% +)	HELPER

Self-care	Admit	Discharge	Follow-up
Eating			
Grooming			
Bathing			
Dressing-upper body			
Dressing-lower body			
Toileting			
Sphincter control			
Bladder management			
Bowel management			
Transfers			
Bed, chair, wheelchair			
Toilet			
Tub, shower			
Locomotion	Walk / Wheelchai / Both	Walk / Wheelchai / Both	Walk / Wheelchai / Both
Walk/ wheelchair			
Stairs			
Motor subtotal score			
Communication			
Comprehension	Audito / Visual / Both	Audito / Visual / Both	Audito / Visual / Both
Expression	Vocal / Non / Both	Vocal / Non / Both	Vocal / Non / Both
Social cognition			
Social interaction			
Problem solving			
Memory			
Cognitive subtotal score			
Total FIM			

Note: leave no blanks; enter 1 if patient not testable due to risk.

Appendix (7)

Covering letter and consent form

أشكر تعاونكم في إتمام هذا البحث الخاص حول جودة الحياة لمرضى الجلطة الدماغية الذين تلقوا برنامج تأهيل في قطاع غزة.

إن هذا البحث يشكل جزء ضروري في دراستي للحصول على درجة الماجستير في علوم التأهيل من الجامعة الإسلامية في غزة. الباحث:ذه الدراسة لتحديد مستوى جودة الحياة لدى مرضى الجلطة الدماغية بعد تلقيهم خدمة التأهيل،كما وتهدف أيضا لمعرفة العوامل التي تؤثر على جودة الحياة بعد الجلطة الدماغية .هذه الدراسة لن تسبب لك أي أذي، و بدون أن تؤثر على علاجك في المستقبل.

هل توافق على المشاركة في هذه الدراسة علما بأنة من حقك الامتناع عن الإجابة عن أي سؤال في الاستبيان ، ويمكنك الانسحاب من الدراسة في أي وقت تشاء.

أوافق

لا أوافق

ملاحظه / الوقت اللازم لتعبئة الاستبانة كاملة هو 20 دقيقة

الباحث : فؤاد محمد لظن

أخصائرقم:اج الوظيفي بمستشفى الوفاء للتأهيل الطبي / غزة – الشجاعية .

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الباحث