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Psychological, physical dysfunctions and risk factors of hemiplegic patients in Gaza Strip

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بسم الله الرحمن الرحيم

{ لاَ يُكَلِّفُ ّالله نَفْسًا إِلاَّ وُسْعَهَا
لَهَا مَا كَسَبَتْ وَعَلَيْهَا مَا
اكْتَسَبَتْ رَبَّنَا لاَ تُؤَاخِذْنَا إِن
نَّسِينَا أَوْ أَخْطَأْنَا رَبَّنَا وَلاَ
تَحْمِلْ عَلَيْنَا إِصْرًا كَمَا
حَمَلْتَهُ عَلَى الَّذِينَ مِن قَبْلِنَا
رَبَّنَا وَلاَ تُحَمِّلْنَا مَا لاَ طَاقَةَ
لَنَا بِهِ وَاعْفُ عَنَّا وَاغْفِرْ
لَنَا وَارْحَمْنَآ أَنتَ مَوْلاَنَا
فَانصُرْنَا عَلَى الْقَوْمِ
الْكَافِرِينَ }

(سورة البقرة 286)

صدق الله العظيم

بـسم الله الـرحمن الـرحيم

Dedication

I would like to dedicate my work with deep love

To

The soul of my brother Nehad

The soul of my mother

My father

My wife

My family

My colleagues and to the real friends

For their ever constant endless love and support.

Ahmed Shokry Yasin

In the name of Allah, the Beneficent, the Merciful

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First of all, praise be to God, the lord of the word, and peace and blessings of God be upon the noblest of the Prophets and messengers, our prophet Muhammad, all thanks for God who granting me the help and capability to complete this thesis.

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I would like to express my deep thanks and gratitude to the administration of national center for community rehabilitation as well as UNRWA physiotherapy centers who helped me to complete this study.

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The abstract

The background and the purpose: The purpose of this study was to examine the hemiplegic psychological and physical dysfunctions and the rehabilitation effect on these disabilities. Also to understand the different risk factors frequencies among hemiplegic patients in Gaza Strip.

The methods: The study depend on cross sectional design. It included 163 rehabilitated hemiplegics, 96 of them are males, and 67 of them are females who were rehabilitated at the period from 1-1-2005 to 31-12-2010 at the national center for community rehabilitation and UNRWA physiotherapy centers in Gaza city and Khanyounes.

The physical dysfunctions was measured by Short Form-36 (SF-36) instrument (physical functioning and role limitation due to physical health domains) and the psychological dysfunctions was measured by SCL – 90 - R scale.

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

The results: The study shows that males are exposed to hemiplegia more than females, age group above 40 years are more vulnerable to hemiplegia than younger ages and psychological stresses are the highest frequency risk factor for hemiplegia.

The results show that 39.98% of the participants had psychological symptoms and only 6.75% of them passed the standard deviation above the mean which means high level of mental health.

The results show that 75.96% had mild to moderate physical disabilities while 22.5% had role limitation due to physical health which means that most of the participants 77.5% has good satisfaction in their activities of daily living.

The results show that hemiplegia physical disabilities are age dependent while functional disabilities are affected more by hypertension.

The results show that the hemiplegic patients have the most benefits on the physical functioning domain when they commenced rehabilitation directly after having stroke and continued rehabilitation from 30 to 60 days, while the most benefits on the role limitation due to physical health domain when they commenced rehabilitation more than one year after having stroke and continued rehabilitation from 30 to 60 days.

The results show that rehabilitation reduces the psychological symptoms effect when commenced directly after having stroke and continued rehabilitation from 30 to 6o days.

ملخص الدراسة

أهداف الدراسة: تهدف هذه الدراسة لفحص الاضطراب الوظيفي النفسي و الجسدي لدى مرضى الشلل النصفي الطولي في قطاع غزة و تأثير عملية التأهيل على الاضطراب الوظيفي النفسي و الجسدي و كذلك تكرارات عوامل الخطر المختلفة لدى مصابي الشلل النصفي الطولي في قطاع غزة.

الأدوات المستخدمة: استخدم الباحث مقياسين أحدهما لقياس الاضطراب الوظيفي الجسدي (SF-36) حقل الوظائف الجسدية و القيد في الدور بسبب الصحة الجسدية أما المقياس الآخر فهو (SCL – 90- R) وذلك لقياس الاضطراب الوظيفي النفسي لدي مصابي الشلل النصفي الطولي.

الإجراءات: شملت عينة الدراسة 163 مشارك (96 من الذكور و 67 من الإناث) و الذين تلقوا خدمة التأهيل في المركز الوطني للتأهيل المجتمعي و مراكز العلاج الطبيعي التابعة لوكالة الغوث أنروا في مدينة غزة و خانيونس في الفترة من 1-1-2005 و لغاية 31-12-2010، و قد تم اختيار هذه العينة بطريقة العينة العشوائية البسيطة.

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

النتائج: تظهر نتائج الدراسة بأن الذكور أكثر عرضة للشلل النصفي الطولي من الإناث و بأن الفئة العمرية فوق سن 40 سنة هم الأكثر عرضة للإصابة بالشلل النصفي الطولي.

تظهر نتائج الدراسة بأن 39.98% من المشاركين لديهم أعراض نفسية مصاحبة للجلطة و أن فقط 6.75% من هؤلاء تعدى الانحراف المعياري فوق المتوسط مما يعني بأن المشاركين لديهم مستوى عالي من الصحة النفسية.

تظهر نتائج الدراسة بأن 75.96% من المصابين لديهم اضطراب وظيفي جسدي بين خفيف إلى متوسط بينما فقط 22.5% لديهم محدودية في أداء الوظائف الحياتية بسبب الصحة الجسدية مما يعني أن 77.5% لديهم رضا جيد في أنشطة الحياة اليومية.

تظهر نتائج الدراسة بأن عامل الخطر الأكثر تأثيرا على الاضطراب الوظيفي الجسدي هو العمر بينما الأكثر تأثيرا على الاضطراب الوظيفي بسبب الصحة الجسدية هو ضغط الدم العالي.

تظهر نتائج الدراسة بأن المصابين يستفيدون بشكل كبير في حقل الوظائف الجسدية عندما يبدؤون عملية التأهيل مباشرة بعد الإصابة بالجلطة و استمرار التأهيل من 30 إلى 60 يوم بينما يستفيدون أكثر في حقل القيد في الدور بسبب الصحة الجسدية عندما يبدؤون عملية التأهيل بعد أكثر من عام بعد الإصابة بالجلطة و استمرار عملية التأهيل من 30 إلى 60 يوم.

تظهر نتائج الدراسة بأن التأهيل يقلل من حدة الأعراض النفسية عندما تبدأ عملية التأهيل مباشرة بعد الإصابة بالجلطة و استمرار التأهيل من 30 إلى 60 يوم.

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List of abbreviations

1.	UNRWA	United Nations Relief and Works Agency
2.	GNP	Gross National Product
3.	GDP	Gross Domestic Product
4.	NGOs	Non Governmental Organizations
5.	MOH	Ministry of Health
6.	PHC	Primary Health Care
7.	CVA	Cerebro Vascular Accidents
8.	PSD	Post Stroke Depression
9.	ADL	Activities of Daily Living
10.	TIA	Transient Ischemic Attack
11.	SF-36	Short Form-36
12.	AHA	American Heart Association
13.	CT	Computed Tomography
14.	MRI	Magnetic Resonance Imaging
15.	SAH	Subarachnoid hemorrhage
16.	AVM	Arteriovenous malformation
17.	ICA	Internal Carotid Artery
18.	MCA	Middle Cerebral Artery
19.	ACA	Anterior Cerebral Artery

20.	WHO	World Health Organization
21.	GAD	Generalized Anxiety Disorder
22.	OCD	Obsessive Compulsive Disorder
23.	CR	Catastrophic Reaction
24.	AOS	Apraxia of Speech
25.	FIM	Functional Independence Measure
26.	DSM	Diagnostic and Statistical Manual of Mental Disorders
27.	QOL	Quality of Life
28.	HRQOL	Health Related Quality of Life
29.	SIS	Stroke Impact Scale
30.	HAD	Hospital Anxiety and Depression Scale
31.	SCL	Symptom Distress Check list
32.	DM	Diabetes Mellitus
33.	RR	Risk Ratio
34.	PT	Physical Therapist
35.	OT	Occupational Therapist
36.	PFD	Physical functioning domain
37.	FES	First Ever Stroke
38.	MH	Mental health
39	PFD	Physical functioning domain
40	MOS	Medical outcomes study

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CHAPTER ONE

THE STUDY PLAN

1.1. Introduction

Hemiplegia is paralysis of longitudinal half of the body which can be caused by many causes mainly stroke which will be the focus of this study. There are various emotional, physical and social consequences of hemiplegia which can affect the individual's quality of life and the family of the patient too. Rehabilitation is a discipline which can play an important role in reducing these consequences which in turn can improve the patient's quality of life. This study aimed to increase the knowledge of this role in Gaza Strip.

Stroke is a complex dysfunction caused by a lesion in the brain. This results in an upper motor neuron dysfunction that produces hemiplegia or paralysis of one side of the body and limbs that are contralateral to the hemisphere of the brain with the lesion. Thus a lesion in the left cerebral hemisphere, or left CVA, produces right hemiplegia, and vice versa. When referring to the patient's disability as right hemiplegia, the reference is to the paralyzed body side and not to the locus of the lesion (Wade, 1986). The muscles of the face and mouth also may be involved. The paralysis is usually characterized by increased muscle tone or spasticity (Pedretti, 1990).

Stroke has also been termed cerebro vascular accident (CVA), hemiplegia, apoplexy and brain attack (Dennis et al. 1990).

Hemiplegia is total paralysis of the arm, leg, and trunk on the same side of the body, whereas hemiparesis is weakness on one side of the body. The most common cause is stroke (Oatis and Craik 1995). Hemiplegia can be a disorder present at or around birth, or it may be acquired after birth. The underlying cause of hemiplegia is damage to the brain as a result of disrupted blood flow. This disruption can be caused by several factors. There are many different types of hemiplegia. Facial hemiplegia is characterized by paralysis of one particular side of the face. Cerebral hemiplegia occurs when a brain lesion disrupts the flow of blood to the brain. Spastic hemiplegia is characterized by paralysis along with spastic movements of the affected side. Spinal hemiplegia is caused by lesions that have formed on the spine (Spivack 1995).

Stroke is caused by ischemic brain infarct in 80% of all cases, with transient ischemic attacks and intracerebral and subarachnoidal hemorrhages being less frequent (Bonita, 1992).The consequences of stroke are often catastrophic for the patient, and a significant economic burden for society in the form of loss of ability to work, loss of independence in activities of daily living (ADL) and nursing home placement (Kaste et al, 1998).

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).

In western industrialized societies, stroke is the third leading cause of neurological deficits and death. Globally cerebrovascular disease is the second leading cause of death. In the year 2005 stroke accounts for 5.7 million deaths worldwide, equivalent to about 10% of all deaths.

Recent studies in India showed that the age adjusted annual incidence rate was between 250-350/100,000 in urban community of Kolkata and 262/100,000 in rural community of Bengal (Banerjee and Das, 2006).

According to the Palestinian annual report 2006, CVA 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. In the recent report 2009 there is no data regarding the prevalence of stroke in Gaza Strip due to the Palestinian political situation, the only data provided was for West bank.

It is important to mention that hemiplegia is not curable condition, also it could be not progressive, but there are many complications associated with hemiplegia rather than the paralysis of both limbs and the trunk. A person who has hemiplegia may suffer little or no brain damage and disability, especially if hemiplegia is treated promptly.

Mood disorders are common but often unrecognized companion of stroke. The reported prevalence of post-stroke depression (PSD) varies from 20% to 65% (Robinson 1997). PSD is known to be related to dependence in activities of daily living (ADL) and to the severity of neurological deficits (Kotila et al 1998), but the knowledge of its neuropsychological correlates is limited.

Depression was diagnosed in 53% of the patients at 3 months and in 42% of the patients at 12 months post-stroke according to DSM-III-R-criteria. One third of the patients were aphasic, 70% of them at 3 months and 62% at 12 months after stroke suffering from depression. Among the aphasic patients the prevalence of major depression increased from 11% to 33% during the 12 months' follow-up. There was an association between post-stroke depression and cognitive impairment, the domains most likely to be defective being memory, non-verbal problem solving, and attention and psychomotor speed (http://herkules.oulu.fi/isbn9514254279/html/index.html).

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).

1.2. region profile and socio-cultural background:

1.2.1 Palestine History:

Palestine was known as the land of Canaan in ancient history, it 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 (consist of ten provinces in the north) and Gaza strip (consist of five provinces in the south).

The total area of Palestinian territories is 6,160 sq.km. With total population living in 4,048,403 individuals, 50.8% are males and 49.2% are females.

The region of the study Gaza strip is a narrow piece of land lying on the lower part of the eastern coast of the Mediterranean sea. Gaza Strip is an overcrowded place with an area 365 sq.km and population was estimated 1,535,120 individuals mainly concentrated in the cities, small villages, and the eight refugee camps. The density rate in GS is very high 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 are 297,269 individuals.

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 are 534,558 individuals.

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 are 222,866 individuals.

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 are 291,737 individuals.

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 are 188,690 individuals. (Ministry of Health, 2010).

1.3. Palestinian health care system:

1.3.1. Health care system:

Primary health care (PHC) centers are 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. PHC 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-Aqsa), 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 but after the last war on Gaza the total health care system been collapsed as a result of the huge destruction and siege on Gaza Strip. Now PHC centers try to offer accessible and affordable health services for all Palestinians regardless the geographical locations as possible.

1.3.2. Primary health care providers in Palestine:

Three main health providers today provide the health services in Palestine with 693 center 559 center in west bank and 134 center in Gaza Strip.

1- The Palestinian ministry of health (MOH): it has the authority of supervision, regulation, licensure, and control of the whole services and it is considered the main provider for the health services with 63.3% from the total PHC centers, 381 center in west bank and 59 center in Gaza Strip.

2- Nongovernmental organizations (NGOs): NGOs considered the second provider for the health services after MOH with 28.3% from the total PHC centers, 137 center in west bank and 57 center in Gaza Strip.

3- United Nations Relief and Works Agency (UNRWA): is considered the third provider for the health services in Palestinian with 8.1% from the total PHC centers, 41 centers in west bank and 18 center in Gaza Strip.

It is worth to mention that the private sector plays an important role in providing PHC services to Palestinian people but there is limited information about these centers. (Ministry of Health, 2010).

1.3.2.1. 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 2008, there are 44 general hospitals with 3,558 beds, 10 specialized hospitals with a total bed capacity of 805 beds, 18 maternity hospitals at a total bed capacity of 350 beds and four rehabilitation centers with a total bed capacity of 165 beds, and all of the rehabilitation hospitals are owned and operated by the NGOs. (Ministry of Health, 2010).

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

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, Al-Aqsa University and the UNRWA physiotherapy program.

1.4. Research hypothesis

1. There is no relationship between risk factors and physical dysfunctions of hemiplegia in Gaza strip.
2. There is no relationship between risk factors and psychological dysfunctions of hemiplegia in Gaza strip.
3. There is no relationship between rehabilitation and reduction of physical dysfunctions of hemiplegia in Gaza strip.
4. There is no relationship between rehabilitation and reduction of psychological dysfunctions of hemiplegia in Gaza strip.

1.5. Objectives of the study

1.5.1. General Objectives

- To understand the major risk factors frequencies of hemiplegia in Gaza Strip.
- To understand the impact of hemiplegia on the psychological and physical conditions of the patient in order to reduce the incidence of hemiplegia and associated dysfunctions.

1.5.2. Specific Objectives

- To determine the risk factors frequencies of hemiplegic patients.
- To investigate the relationship between risk factors frequencies and development of hemiplegia.
- To investigate the relationship between rehabilitation and hemiplegia consequences.

1.6. importance of the study

- Hemiplegia may affect multiple dimensions among affected patients which can have catastrophic effects but little attention has been paid here in Gaza Strip to the psychological dimension.
- Although much is known about the long-term outcomes of hemiplegic patients in terms of mortality and disability, there has been no evidence that any research have been conducted in Gaza Strip to evaluate the psychological and physical dysfunctions that follow and the rehabilitation effect on these dysfunctions.
- Using standardize outcome measure as short form 36 (SF-36) Arabic-version and SCL-90-R will help health professionals to evaluate physical and psychological dysfunctions among hemiplegic patients and to find out

Follow-up system based on outcome measure using well known SF-36 and SCL-90-R.

CHAPTER TWO

THE THEORITICAL BACKGROUND

Introduction:

Hemiplegia is total paralysis of one side of the body and this can happen due to many reasons like stroke, gunshot and other diseases.

Stroke is a disease of high incidence and high mortality rates and the main outcome for the stroke survivor s is hemiplegia.

Hemiplegia has many physical and psychological consequences which can affect the patient's life .

The researcher will consider only hemiplegia as a result of stroke.

2.1. Definition of hemiplegia

Hemiplegia is total paralysis of the arm, leg, and trunk on the same side of the body, whereas hemiparesis is weakness on one side of the body. The most common cause is stroke (Oatis and Craik, 1995).

Stroke has also been termed CVA, hemiplegia, apoplexy and brain attack. (Dennis et al. 1990).

Of those who survive the initial onset of stroke, the most frequent presenting problem is hemiplegia or hemiparesis, which occurs in about 75%–88% of survivors at 30 days with an equal number of right and left hemiparetics. Generally the paralysis occurs on the side of the body opposite the brain damage so that an individual with right brain damage will sustain a paralysis or weakness on the left side of the body. An individual with left brain damage will sustain a paralysis or weakness on the right side of the body. (Gresham et al., 1995).

Stroke or 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. Stroke symptoms that resolve completely within 24 hours defined as transient ischemic attack (TIA) (Cuccurullo 2004).

The researcher will adopt the definition of Oatis and Craik for hemiplegia because it comes on line with this study. Also the researcher will give the following operational definitions for psychological and physical dysfunctions.

Psychological dysfunctions are the psychological symptoms that an individual show as a reaction to a harmful stimuli to the self and with time if not treated can cause a psychological illness.

Physical dysfunctions are any physical abnormality that can affect an individual's functional life.

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 795,000 people suffer a stroke. About 600,000 of these are first attacks, and 185,000 are recurrent attacks (American heart association (AHA), Heart and Stroke Statistical Update, 2010).

Stroke mortality in 2005 was 143,579 people (56,586 males, 86,993 females) and accounted for about 1 out of 17deaths 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, 2010).

In western industrialized societies, stroke is the third leading cause of neurological deficits and death.

Globally CVA is the second leading cause of death. In the year 2005 stroke accounts for 5.7 million deaths worldwide, equivalent to about 10% of all deaths.

According to the Palestinian annual report 2006, CVA 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. In the recent report 2009 there is no data regarding the prevalence of stroke due to the Palestinian political situation.

2.3. Risk factors (Goldstein, 2009)

2.3.1. Non-modifiable risk factors:

- **Age:** although stroke can impact persons of any age, it is a disease mainly affecting the older population: the risk of stroke doubles for each decade after age 55.

- **Sex:** As with cardiovascular disease, the prevalence of stroke is higher in men than in women, and this holds true for most age groups, with the exception of the 35- to 44-year-olds and individuals older than 85. In these age groups, women have a higher age specific stroke incidence. Women's use of oral contraceptives and pregnancy contribute to the higher incidence. Men die earlier from cardiovascular disease, and this explains the higher

risk of stroke in older women; women account for the majority of stroke deaths in the United State (61.5%).

2.3.2. Modifiable (treatable) risk factors:

- **Hypertension:** This is arguably the most important of the modifiable risk factors, responsible overall for approximately 50% of all strokes, and especially for intracerebral hemorrhages. The risk of developing hypertension increases with age: over 90% of persons who are normotensive at age 55 will become hypertensive by their ninth decade.
- **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:** Smoking is associated with a 2-fold increased risk of ischemic stroke, and it is estimated to contribute to 12–14% of all stroke deaths. There is also a synergistic effect between smoking and OC use: over three times higher risk compared with nonsmoking OC users. Passive smoking is also associated with an increased risk for heart disease and stroke. Physiological effects of smoking include increase of heart rate and mean arterial pressure and decrease in arterial distensibility. Quitting smoking is associated with a decreased risk for stroke, which approaches baseline after approximately 5 years from quitting
- **Hyperlipidemia:** Several studies have found an increased risk for ischemic stroke in patients with elevated total cholesterol. The data on the relationship between low-density lipoprotein cholesterol and ischemic stroke are weaker, whereas several studies have shown increased prevalence of ischemic stroke in persons with low high-density lipoprotein cholesterol (especially less than 30 mg/dL). Elevated triglycerides are also associated with higher rates of cerebral ischemia.
- **Psychosocial factors:** May et al (2002) report that psychological distress is a predictor of fatal ischemic stroke. Also Jood et al (2009) reported that there is an independent association between self perceived psychological stress and ischemic stroke. Kimberly et al (2007) reported that depressive symptoms were an independent risk factor for incident stroke/ transient ischemic attack in individuals <65 years.

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 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 (magnetic reasoning image (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: (Cuccurullo 2004)

1. **Anterior circulation**

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

2. **Posterior circulation:**

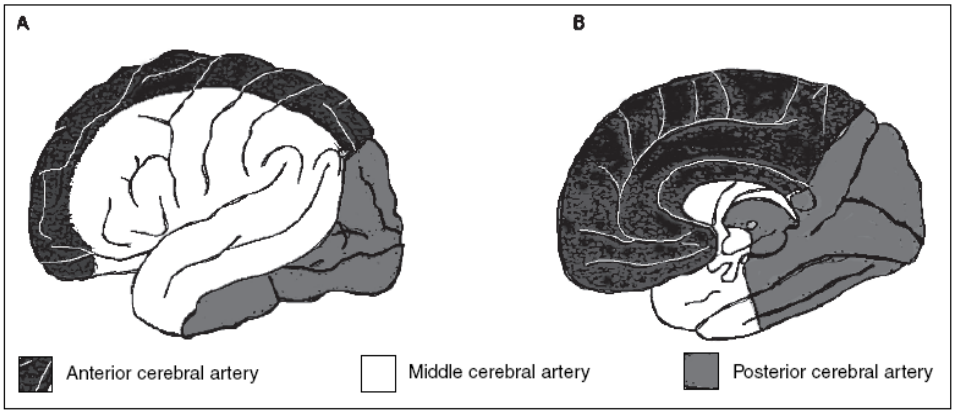
Which include Vertebrobasilar Arteries & Posterior Cerebral Arteries

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, 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 (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.

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).

2.5. Diagnosis of hemiplegia

Patient history and the physical examination provide information pointing out to stroke as the possible cause of the symptoms. Lab evaluation includes blood analyses like: Erythrocyte sedimentation rate , Blood sugar, Fasting lipids, Clotting screen (Edmans Judi et al 2001) and image studies (computer-aided topography of the brain (CT) or MRI) (Table 2-1).

Table 2-1: 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. Hemiplegia dysfunctions:

2.6.1. psychological dysfunctions:

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).

Psychological distress, particularly in the form of depression, has a number of adverse effects in stroke patients. It impairs social functioning and quality of life and interferes with the recovery of motor and language functions (Carney & Freedland, 2002).

2.6.1.1 Depression:

Depression is the most common mood-related problem after a stroke, with estimates suggesting that between 20 to 50 per cent of patients might be clinically depressed at any one time. The course of depression appears to fluctuate. Some people may feel depressed in the early phase after the stroke, whereas for others

this might not occur until much later on. Feelings of depression can sometimes emerge towards the end of rehabilitation, often as people start to realize that they may not have made as many gains as they had hoped. Although it is understood that there is an organic basis for some depression after stroke, it is generally believed that a number of psychosocial variables are relevant, such as perceptions of social support, being younger, and experiencing problems with activities of daily living Within this context, depression appears to be related to the losses which people perceive to result from the stroke, and a discrepancy between the real self and the ideal self. In some more extreme cases, patients may develop a pervading sense of hopelessness regarding the future, and feelings of depression can become so severe that people feel they no longer want to continue living. It is estimated that stroke patients are at twice the risk of the general population of committing suicide, and that this risk is greater in younger people if they have already had a previous stroke, and if they only spend a short time in hospital (Kennedy 2007).

Bogousslavsky (2002) reported that the prevalence of depression in stroke patients is to be 20–40% in the first 2weeks, 32–53% at 3–4 months , 26% at 6 months , 19–55% at 1 year , 19% at 2 years , and 9–41% at 3 years . Major depression accounts for a minority of cases, with a prevalence of 10–20% in stroke patients, but depending on time elapsed after stroke and the place of residence, can increase up to 40%. The prevalence of minor depression varies between 5 and 40% in stroke patients . The incidence and prevalence of endogenous depression in the general population (15– 33%) are probably more elevated but, in the absence of more specific clinical and neuroradiological data about the different subtypes of depression. The incidence of poststroke depression varies slightly with age and gender. Poststroke depression is reported to be more frequent in women than men when the lesion is in the left hemisphere . In women, major depression correlates with a high level of education, cognitive impairment, and previous psychiatric antecedents, while in men, it is more dependent on physical impairment.

It is important to identify patients at risk as a PSD may have a negative impact on functional recovery (Gainotti 2001), quality of life and mortality (Morris 1993).

The reported prevalence of PSD varies from 20% to 65% (Robinson 1997). PSD is known to be related to dependence in ADL and to the severity of neurological deficits (Kotila et al. 1998), but the knowledge of its neuropsychological correlates is limited.

2.6.1.2 Anxiety:

Anxiety is an emotional state involving physiological arousal (increased heart rate), verbal reports of feelings of distress, overt behavior of avoidance, and cognitive disruption (i.e. maladaptative shifts in attention due to off-target thinking), hyperawareness about possible threat events are occurring in an unpredictable manner. ening cues, and the perception that adverse Approximately 25–50% of patients manifest anxiety in acute phase of stroke. Existing data about

the relationship of anxiety with location site are not conclusive. Anxiety after stroke shares many features with post-traumatic stress disorders, both corresponding to a sudden and unpredictable life-threatening stressor. In these disorders, the extension and volume of the lesion do not correlate with anxiety level, which probably results from the co occurrence of individual traits, psychosocial dynamics, and a deregulatory lesion effect on the limbic system with autonomic changes (Bogousslavsky 2002).

Stein et al (2009) reported that there is a strong comorbidity between post-stroke anxiety disorder and PSD.
Generalized anxiety disorder (GAD) rate was 28% in acute stroke patients, with no significant decrease in prevalence throughout the three-year follow-up. Of all patients with GAD, about 50% had GAD alone, and 50% had GAD plus major depression.

Kennedy(2007) reported that Anxiety following a stroke is also common, with approximately 20–40 per cent of people being affected at any one time. The experience of anxiety is often associated with feelings of threat, so this is perhaps not surprising given the enormous threat that a stroke is to a person's life. Anxiety tends to be characterized in terms of the physical experience of anxiety (bodily sensations), how patients think about their situation (cognition), and what they actually do to cope with their worries and concerns (behavior). Generalized feelings of anxiety are the most common. Patients and their families often express concerns about how they are going to cope in the future, how the stroke will change their lives, the impact of their stroke on their relationships, families and friends, and whether they are likely to have another, potentially life-threatening, stroke in the future. A certain degree of anxiety is, however, expected to occur, as patients and families face the challenge of coping with the crisis of the stroke. In some cases though, these feelings of anxiety can become so intense that they impact negatively on the rehabilitation process, and prevent the patient from engaging fully with their therapy. Panic is a specific type of anxiety sometimes experienced by stroke patients, and tends to be characterized by very rapid or deep breathing. The effect of this is that the amount of oxygen in the lungs will be reduced, and this can then in turn lead to a range of unpleasant body sensations, such as faintness, dizziness, tingling, headaches, racing heart, flushes, nausea, chest pain, and shakiness. These sensations can be extremely worrying for the patient, and are often misinterpreted as something medically wrong, such as having another stroke. Fears and concerns then intensify, which results in further over breathing, and hence a vicious circle of panic can develop. Phobias are another form of anxiety that can develop after a stroke, and are characterized by a sometimes unrealistic fear of a particular object, person or situation, which results in avoidant behavior. Specific phobias which sometimes develop include: fear of moving, sometimes from the bed to a chair, or from the chair to the toilet; fear of tackling the stairs; and fear of mixing with people and of being in social situations. This last fear, often known as a social phobia, is very common after a stroke. Many patients experience intense negative feelings about reintegrating into their previous social networks. Patients often report that they feel very different to how they did before the stroke, feel that they look very different (even if they do not),

and worry about their ability to communicate with people. Patients often report experiencing feelings of shame, and the last thing that they want is for people to feel sorry for them. Hence, they tend to avoid situations which will bring them into contact with often previously known people.

2.6.1.3 Mania:

The incidence of mania in acute stroke is about 1% (271) and most cases are associated with right hemispheral infarcts. Patients with poststroke mania show the symptoms of elation, pressured speech, flight of ideas, grandiose thoughts, insomnia, hallucinations, and paranoid delusions. A non disabling mania with hyperphagia and a specific preference for fine food 'Gourmand syndrome' has been reported in a few patients following right anterior frontal lesions (Bogousslavsky 2002).

2.6.1.4 Psychosis:

Behavioral symptoms of psychosis have been frequently reported in acute stroke but the real prevalence is unknown. At least four symptom clusters have been identified: namely, affective, paranoid delusional, confusional state, and changes in mood with behavioral disturbances, but the mechanisms involved are unclear. Reduplicative paramnesia, Capgras's and Fregoli's syndromes are special forms of delusions (delusional misidentification syndromes). Reduplicative paramnesia is a bizarre disturbance where the patient believes to be in a different place against all possible evidence. Capgras's syndrome describes the patient's belief that some familiar or known persons, or the patient himself, has been substituted or replaced by a sosia. Although elements of prosopagnosia or visual agnosia could be present, they are not sufficient to explain symptoms. Patients with Fregoli's syndrome attribute the displacement of some psychological characteristic from one person to another. In acute stroke, delusional misidentification syndromes may be the result of a disconnection of cerebral areas specialized in face (fusiform gyrus) and place (parahippocampal gyrus) recognition, with the most anterior inferior and medial part of the right temporal lobe where long-term memory, retrieval, and visual recognition mechanisms of faces and scenes are stored. Psychosis has been generally reported with right hemispheral stroke, especially in the temporoparietooccipital junction regions or in the thalamus. Old age and pre-existing degenerative disease or cerebral atrophy increases the risk (Bogousslavsky 2002).

2.6.1.5 Obsessive compulsive disorder :

Obsessive-compulsive disorder (OCD) includes a broad range of symptoms such as intrusive thoughts, preoccupations, rituals, and diverse motor behaviors. OCD is reported after a period varying from days to years following cerebral lesions, often with progressive worsening over time. Few cases have been reported with stroke, almost all with basal ganglia lesions, whereas OCD is more frequent with cranial trauma. The dorsolateral frontal zones allow monitoring of ongoing activities according to environmental changes. Disruption of this system

may result in difficulty terminating abnormal behavioral acts. The basal ganglia and ventral caudate are thought to be a 'gating station' for sensory information. Their dysfunction may leave the afferent information from the frontal lobes improperly regulated, with consequent inappropriate responses (Bogousslavsky 2002).

2.6.1.6 Emotionalism:

Emotional lability 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 et al 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.

Bogousslavsky (2002) also reported that emotionalism or emotional lability is an increase in the frequency of crying or laughing, starting with little or no warning. This syndrome is frequent in acute stroke (40% in personal data), at 1 month follow-up (21%), but prevalence declines over the first 6 months (15-21%). Emotionalism is often associated with depression, irritability, ideas of references, and other psychiatric conditions. Several locations have been reported, e.g. anterior lesions, or frontal and temporal lesions, subcortical lesions, lenticulocapsular, but a specific link between lesion location and the emergence of emotionalism has not yet been demonstrated.
According to Wilson's theory, the voluntary and involuntary control on laughter are determined by two relatively independent systems: the first connects the frontal lobe or critical cortical area to brainstem nuclei necessary for motor behaviors and coordination; the second is an unknown location. This theory explains why even small or unilateral lesions that result in imbalance in the whole system may cause involuntary crying or laughter.

Kennedy(2007) reported that emotionalism after a stroke is characterized by uncontrollable crying or laughing. Traditionally, the cause of this was believed to be organic and unrelated to mood. However, more recent research has suggested a direct link with mood. People describe that they burst into tears for no apparent reason, and that it is not necessarily a reflection of how they are actually feeling. This can then lead to feelings of embarrassment, particularly if this occurs in the presence of other people. Families may also find it distressing to see their relative upset. In the majority of cases this emotional expression tends to dissipate over time.

2.6.1.7 Catastrophic reaction (CR):

CR manifests as a disruptive emotional behavior when the patient is confronted with an unsolvable task. The abnormal emotional content of CR, its stereotyped character and dissociation from physical impairment suggest a specific

lesion induced neural dysfunction. Only patients with left hemispheral lesion manifested catastrophic behaviors. The CR may be the behavioral translation of a 'paleological thinking', emerging by homologous areas of the right hemisphere when language areas are damaged in the left. In CR patients, damage of critical language areas in the left hemisphere may cause loss of the modulatory amygdala effect. Catastrophic reaction was not associated with depression early after stroke but most patients (8/12=66%) developed 3 months later, emotionalism or PSD, a finding which suggests a time-related correlation among these disorders, possibly originating from an imbalance of a frontal/temporal lobe-limbic-basal ganglia circuitries with left dominance(Bogousslavsky 2002).

2.6.1.8 Apathy:

Apathy is a frequent neuropsychiatric disorder observed in patients after stroke. Reduced motivation or interest, lack of initiative, little spontaneous speech, lack of feeling and emotion, and lack of concern are the phenomenological expressions characterizing apathy. Apathy rate in acute stroke patients may vary from 23–50%. Apathy is also associated with older age and impairment in functional activities of daily living and cognitive performances. caregivers of patients with stroke frequently complain of patients' apathy because of their increased functional dependence in daily living activity(Stein et al 2009).

Bogousslavsky (2002) defined apathy as a lack of motivation not attributable to a reduced level of consciousness, cognitive impairment, or emotional distress, which manifests as flat affect, short and delayed answers, hypophonia, reduced motor responses, fixed and blank face, perseverations, and lack of awareness of the situation.

2.6.1.9 Aggression:

Aggressive behavior is described as a quite frequent complication in stroke patients. However, the described level of aggression is generally not very severe. about one out of four patients with acute stroke may experience mild symptoms of aggressiveness, and 5-10% of stroke patients may suffer from severe angry outburst. These aggressive symptoms have to be detected and properly treated because they cause severe stress for caretakers, poorer quality of life, and negative outcome during rehabilitation. There is a correlation between aggressiveness and cognitive impairment or affective symptoms of depression and anxiety in stroke patients seen both in acute hospital or rehabilitation hospital. In addition, correlation between aggressive behavior and cognitive impairment has been described as a phenomenon particularly affecting left hemispheric stroke patients (Stein et al 2009).

2.6.2. physical dysfunctions:

Sequelae of stroke include upper and lower limb motor and sensory loss, language, communication and cognitive difficulties, perceptual difficulties, bowel and bladder dysfunction and dysphagia (Wolfe 2000).

In this part we will consider the motor, sensory loss and communication dysfunctions resulted from motor impairment. Some other limitations due to these disabilities will be considered and will be called concomitant dysfunctions. Stroke is the most important cause of physical disability in people over 60 years of age (Kaste et al. 1995).

2.6.2.1 motor dysfunctions:

The term motor refers to motion and movement of the limbs and body. Many stroke patients become weak, stiff, or uncoordinated after a stroke (Caplan, 2006)

Lawrence et al (2001) reported that motor impairments are the most commonly reported impairments after acute stroke, with upper limb motor deficits present in 77% and lower limb motor deficits present in 72% of patients one week after onset of first-ever stroke.

Impairments including paresis (Kwakkel et al. 2003) reduced muscle strength, impaired muscle activity co-ordination during task performance (Canning et al. 2004) sensory loss (Broeks et al. 1999) and altered muscle tone (Pandyan et al. 2005) are common. These impairments may lead to secondary problems such as pain (Dromerick et al. 2008), loss or range of movement and muscle contracture which in turn cause functional limitations.

(Raine 2007) has identified that abnormal coordination of movement patterns, poor balance, sensory deficits and abnormal tone are the main physical problems of people with hemiplegia.

1. motor weakness:

The severity of weakness varies from a very minor decrease in strength to paralysis, which is the total inability to voluntarily move a limb or a part of a limb. Weakness usually involves the arm, hand, leg, and foot on one side of the body. This pattern of one-sided weakness is referred to as hemiparesis. Paralysis of the limbs on one side is called hemiplegia. The hand and arm are usually affected more than the leg and foot. The leg most often recovers enough to allow standing and walking, but hand recovery is usually not as complete (Caplan, 2006)

Bogousslavsky and Caplan (2001) reported that motor weakness, isolated or in association with other symptoms or signs, is the commonest problem of stroke patients. In epidemiological stroke studies, motor deficit (paresis/paralysis) is found in 80–90% of all patients. Hemiparesis with uniform weakness of the hand, foot, shoulder, and hip is the most frequent (at least two-thirds of cases) motor-deficit profile.

(Dobkin 1995) also reported that hemiparesis is the most constant neurologic finding, its frequency in the acute stage varying from 70 to 85%.

It is important to consider weakness not only as a muscular problem following stroke, but as reduced specificity of neuromuscular innervations, with weakness seen both in the trophic and synaptic components of neural activity (Kandel et al. 2000). Although strength of individual muscle groups is less important than their coordination in patterns of activity, strength may still be an issue for efficient movement in some patients, as muscles need sufficient activity to generate force for action and function (Mayston 2001).

2. reduced balance:

Reduced balance is another common motor impairment, and about 50% of those admitted to further rehabilitation were not able to stand without support one month after onset of stroke (Benaim et al., 1999).

Tyson et al (2006) reported that balance disability is common after stroke. In their study a total of 83% of the subjects (n_62) had a balance disability; of these, 17 (27%) could sit but not stand, 25 (40%) could stand but not step, and 20 (33%) could step and walk but still had limited balance. Subjects with the most severe balance disability had more severe strokes, impairments, and disabilities. Weakness and sensation were associated with balance disability.

3. spasticity and contractures:

Spasticity has been defined as a motor disorder characterized by velocity-dependent increase in muscle tone with exaggerated tendon reflexes. It develops in between one-fifth and one-third of hospital-admitted stroke patients over the first year and is more common in those with hemiparesis and after severe strokes, and is more common in the arm than the leg. However, spasticity contributes to disability in only a minority of patients with hemiplegia. Spasticity is usually accompanied by muscle weakness and clumsiness and sometimes by flexor or extensor spasms. Immediately after a stroke the muscular tone in the limbs and trunk may be lower, the same as, or higher than normal. Although tone may be lower than normal in the acute phase, in most patients who do not recover it tends to increase over the first few weeks. In patients with a hemiparesis, the tone in the arm is usually greater in the flexors than extensors, while in the leg it is greater in the extensors than the flexors. This explains the typical hemiplegic posture (i.e. elbow, wrist and fingers flexed and arm adducted and internally rotated with the leg extended at the hip and knee and the foot plantar flexed and inverted). Tone in the truncal muscles may also be abnormally high or low. Tone may increase in any muscle group so much that it restricts the active movement which the residual muscle strength can produce. Imbalance in muscle tone can eventually result in shortening of muscles and permanent deformity and so restrict the full range of movement, i.e. contractures (Warlow et al 2007).

Sommerfeld et al. (2004) also reported that spasticity would appear to be a less common problem, as it was present in only 19% of the patients investigated three months after stroke.

4. Loss of dexterity:

Loss of dexterity appears to result from deficits in the sustained and rapid transfer of sensorimotor information between cerebral cortex and spinal cord. According to Bernstein, dexterity is the ability to carry out any motor task precisely, quickly, rationally and deftly. He suggested that dexterity is not present in the motor act itself but rather in its interaction with the changing environment. Although the term 'dexterity' is commonly associated with the hand, Bernstein's definition enables its use to encompass all skilled motor activity. Loss of dexterity appears to involve the loss of coordination of muscle activity to meet task and environmental requirements through an impaired ability to fine tune coordination between muscles. Although impaired dexterity is typically considered in its association with weakness and slowness to contract muscle, there is some evidence that they may be independent phenomena (Carr and Shephered 2003).

2.6.2.2 sensory dysfunctions:

Sensory refers to the ability to feel sensation on the limbs and body. Sensory abnormalities can include loss of feeling, abnormal sensations, or pain. Decreased feeling can affect the limbs, chest, and stomach on one side of the body. Some patients say that their sensory abnormality affects one whole side, as if a line were drawn down the middle of the body, and everything on one side feels abnormal, or less distinct. Loss of feeling often is present in the same limbs that are weak. At times, the sensory abnormality is described as crossed, meaning it affects one side of the face and the other side of the body. In some patients, the loss of feeling can be so severe that they cannot feel touch in an affected area. Loss of touch sensation is referred to as numbness, or anesthesia. Sometimes touch is preserved, but patients cannot feel painful stimulation (analgesia). Often the involved limbs are insensitive to temperature, and patients cannot feel hot, warm, cool, and cold on the involved limbs.

Other sensory abnormalities include tingling, prickling, pins and needles, or burning. Patients often say that the region of abnormal sensation feels as if it had “fallen asleep” after being compressed for a while. These abnormal sensations are called paresthesias. These sensations can be quite annoying. Sometimes painful sensations develop in areas that are numb. Pain is usually not present in the early days and weeks after a stroke, but most often develops later. The pain may be described as icy cold, or burning, sharp, stabbing sensations. Painful feelings are often triggered by touch or use of the involved limb. The body’s sensory system can be simply thought of as having two different types of sensibilities. One type is related to coarse sensations, such as the perception of pain and temperature. Other sensations are fine and precise, and relate to touch, joint position sense, and the ability to detect vibration on the skin and bony prominences. The finer sensibilities predominate when all of the nerve pathways are intact. When these more precise sensory abilities are defective, and parts of the body are anesthetic or show reduced fine touch perception, then all stimuli seem to evoke only coarse, unpleasant sensations that often are described as very hot, very cold, or stabbing (Caplan, 2006) .

Carr and Shephered (2003) reported that tactile impairments include difficulty with localization and discrimination of tactile inputs causing astereognosis (inability to identify a common object by its physical properties with eyes closed), poor two-point discrimination (inability to recognize two points when simultaneously applied with eyes closed) and inability to recognize bilateral simultaneous stimuli.

2.6.2.3 communication dysfunctions:

speech and language problems are common sequelae of stroke that significantly impact the daily lives of stroke survivors. Reduced speech and language skills have negative ramifications on the individual's social, vocational, and recreational activities, often leading to social isolation, loneliness, loss of autonomy, restricted activities, role changes, and stigmatization (Stein et al 2009).

1. Dysarthria:

Dysarthria Is a speech impairment arising from paralyzed or uncoordinated muscles, specifically in the lips, tongue, soft palate and larynx. When dysarthria is very severe, rendering speech uninterpretable, it is termed anarthria. In strokes dysarthria occurs because the nerve supply to the speech muscles has been damaged. Dysarthria is signaled by obvious muscle weakness or paralysis or altered appearance of the face. The mouth may hang open, and there may be drooping of the lips and a flaccidity in the cheeks. Another sign is persistent drooling of saliva. Speech is slurred, indistinct and frequently hyper nasal, because palatal involvement allows air to escape through the nose. Volume is usually reduced, because of poor breath support and weakness in the larynx. In spastic dysarthrias, where muscle muscle tone is abnormally elevated, speech may feature explosive bursts, as the person struggles to initiate voice (Fawcus 2000).

Warlow et al(2007) reported that the most common problems with communication after stroke are aphasia and dysarthria, which may occur separately but frequently coexist. Dysarthria affects about 20% of assessable patients. It usually improves spontaneously and rarely causes major long-term problems. This is fortunate since, although speech and language therapists give patients exercises aimed at improving the clarity of speech, there has been little formal evaluation of these techniques.

2. Apraxia of speech (AOS):

AOS is a disorder that is distinguishable at a theoretical level from both aphasia and dysarthria, but remains somewhat controversial at a more practical level. The main problem is that it still has an unclear neurologic and functional basis and has no universally agreed-upon definition . Traditionally, AOS was defined as a disorder of motor programming, "an articulatory disorder resulting from impairment, due to brain damage, of the capacity to program the positioning of speech musculature for the volitional production of phonemes and the sequencing of muscle movements for the production of words". More recently, it

was suggested that AOS is a motor planning disorder rather than a disturbance in the programming of movements for speech (Stein et al 2009).

2.6.3.4 concomitant dysfunctions:

Estimating and understanding impairments and activity limitations following stroke should a matter be of high priority in health care, as stroke is the leading cause of activity limitations in adults (Khaw 1996).

Stroke leads to limitations in activities including walking, feeding, dressing grooming and toileting, and more complex activities such as cooking, shopping and functioning outdoors (Wolfe 2000). Dependence in ADL adversely influences quality of life for stroke sufferers (Kauhanen et al. 2000).

Also in recent longitudinal studies it has been found that at 6–12 months post stroke, 25–30% of survivors have difficulty with bathing or using stairs, 50% need help with either housework, meal preparation or shopping, and a similar number lack a meaningful social, recreational or occupational activity during the day (Losseff and Thompson 2004).

2.7. Care and rehabilitation:

Lincoln (1991) defines rehabilitation as " the process of restoring an individual to the fullest level of function, a process which includes the promotion of physical, mental and social well-being and independence".

Another definition by the World Health Organization (WHO) 1980 describes rehabilitation as a problem-solving and educational process aimed at reducing the disability and handicap experienced by someone as a result of a disease, always within the limitations imposed both by available resources and by the underlying disease."

Wade (1992) interprets the WHO definition of rehabilitation as "acting upon pathology, impairment or disability to reduce handicap in essence it is the management of change." He then goes on to suggest that although the final goal is always to minimize handicap it is easier and most effective to concentrate on disability. In the field of stroke rehabilitation, the reduction of disability poses a substantial challenge. The ultimate aim of stroke rehabilitation must surely be to return and maintain an individual in their own environment. In the ideal world this means being able to conduct all rehabilitation within the patient's home or immediate district or locality in which the patient lives; the delivery of this treatment is known as community rehabilitation.

Stineman(2001) reported that rehabilitation is a set of philosophies, treatments and therapies that when combined with natural recovery, is intended to enhance patients' potential for participating in meaningful life experiences.

Rehabilitation medicine within the health care setting is the area where different professions meet and work in teams together with the patient to reach a common goal. Rehabilitation medicine ultimately aims at restoring behaviours and perceptions (such as independence, balance, continence and fatigue) through behaviors (such as exercise, teaching, counseling and functional assessment) (Tesio 2003).

Roth et al. (1998) reported that there is a relation between impairment and disability but suggest that rehabilitation has an independent role in improving functioning beyond that explained by recovery alone. Rehabilitation relies on both remediational interventions designed to reduce for example neurological deficit and on teaching compensatory techniques to enhance functional independence in the presence of impairment to give possibilities for participation and quality of life. This is also reflected in the research within rehabilitation medicine.

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.

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 et al 1997).

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.

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 orthotics 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 ADLs such as eating, drinking, dressing, bathing, cooking, reading and writing, and toileting.

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).

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.

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).

CHAPTER THREE

LITERATURE REVIEW

Introduction:

Hemiplegia can result due to many reasons at any age with many psychological, social and physical consequences as a body reaction to this serious illness.

This chapter has been divided into three parts followed by researcher comments:

In the first part studies related to risk factors and epidemiology of hemiplegia will be presented.

In the second part studies related to psychological and physical dysfunctions will be presented.

In the third part studies related to rehabilitation effect on reduction of hemiplegia dysfunctions will be presented.

3.1. Studies related to risk factors and epidemiology of hemiplegia:

Waleed (2008) identified the incidence rates of stroke in north Palestine (i.e., the district of Nablus) among 186 patients with stroke (95 female and 91 male). The average age of the patients was 69.09 ± 10.9 years. Among the total patients, 112 had a first-ever stroke (FES) and 74 had recurrent stroke (RS). The overall (FES + RS) annual crude incidence rate of stroke was 51.4 per 100,000 persons whereas the annual crude incidence rate of FES was 31 per 100,000 persons. The age-adjusted incidence rates were 54.5 (FES) and 89.8 (FES and RS). The overall in hospital mortality was 21% and was higher in patients with RS than in those with FES.

Donmez et al (2007) studied the association between motor and sensorial impairment, to establish the relation to age, hemiplegic side, gender and emotion in ischemic stroke and to determine the factors, influences the recovery of the upper extremity functions in the hemiplegic patients. A total of 112 hemiplegic patients with the condition that at least 6 months were left from the onset of the stroke were assessed. Sensorial and motor functions of the upper extremity were examined by using the Fugl-Meyer Upper Extremity Performance Test, sensorial function test and the Motricity Index. FM motor and sensorial scores were correlated significantly with Motricity index ($p<0.05$). Motor and sensorial impairment were not related with age, hemiplegic side, but there were significantly correlations between the FM (motor-sensorial), Motricity index and emotional status ($p<0.05$). The patients, whose emotional status was good, had higher scores in the sensorimotor function tests and there was a significant difference between the groups ($p<0.05$). It was concluded that the age, hemiplegic side and emotional status are important factors that effects the recovery of the upper extremity in hemiplegic patients.

Study done by Khan (2007) to describe the risk factors and subtypes of young ischemic stroke among Qatari and non-Qatari residents. Hospital based prospective observational study involving all young adults (15–45 years of age) admitted to Hamad General Hospital with first-ever ischemic stroke from

September 2004 to September 2005. A stroke was defined according to WHO criteria. Stroke was confirmed in 40 (32 males and 8 females). Their ages ranged from 17 to 44 years (mean 37.1 ± 13.27). Thirty (75%) of the patients were non-Qatari. The most common risk factors were hypertension 16 (40%), diabetes mellitus 13 (32.5%), hypercholesterolemia 11 (27.5%), smoking 11 (27.5%), and alcohol intake 9 (22.5%). Regarding stroke subtypes, lacunar stroke syndrome was diagnosed in 17 (42.5%), total anterior circulation stroke syndrome in 16 (40%), partial anterior circulation stroke syndrome in 5 (12.5%) and posterior circulation stroke syndrome in 2 (5%). Partial anterior circulation stroke syndrome was observed with a higher frequency in Qatari patients compared with non-Qataris ($p = 0.009$), whereas total anterior circulation stroke syndrome was observed more in non-Qatari than in Qatari patients ($p = 0.03$). Average hospital stay was 18 days. In-hospital mortality was 2.5%.

McGruder et al (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 CVA. 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.

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, 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 CVA. 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.

Liebetrau et al (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).

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 CVA 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)

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 . 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).

Jaakko (1996) reported that risk factors included in an analyses after follow up study were smoking, blood pressure, antihypertensive drug treatment, serum total cholesterol, and diabetes either at baseline or developed during the follow-up. Age- and risk factor-adjusted relative risks for death of stroke were determined with the Cox proportional hazards model. The results of study revealed that Diabetes mellitus was the strongest risk factor for death from stroke among both men and women in univariate and multivariate analyses. In addition, smoking and systolic blood pressure appeared to be independent risk factors among both sexes, as did serum total cholesterol among men. Men with diabetes at baseline appeared to be at a six fold increased risk of death from stroke, while relative risk for men who developed diabetes during the follow-up was 1.7. In women, those who were diabetic at baseline were at higher risk of stroke than women who developed diabetes later (relative risks, 8.2 and 3.7, respectively). Of stroke deaths, 16% in men and 33% in women were attributed to diabetes. Diabetic subjects have a very high risk of death from stroke, particularly women. The data also

suggest that the duration of diabetes is an important factor contributing to the risk of stroke.

JWoo(1991) identified the following risk factors: a history of ischemic heart disease, diabetes mellitus, or hypertension; the presence of atrial fibrillation or left ventricular hypertrophy; a glycosylated hemoglobin A1 concentration of greater than 9.1%; a fasting plasma glucose concentration 3 months after stroke of greater than 6.0 mmol/l; a serum triglyceride concentration 3 months after stroke of greater than 2.1 mmol/l; and a serum lipoprotein(a) concentration of greater than 29.2 mg/dl. They found the following protective factors: a serum high density lipoprotein- cholesterol concentration of greater than 1.59 mmol/l and a serum apolipoprotein A-I concentration of greater than or equal to 106 mg/dl. The patterns of risk factors differed among the three stroke subtypes. When significant risk factors were entered into a multiple logistic regression model, they found a history of hypertension, a high serum lipoprotein(a) concentration, and a low apolipoprotein A-I concentration to be independent risk factors for all strokes. The attributable risk for hypertension was estimated to be 24% in patients aged greater than or equal to 60 years. In this population, in which cerebrovascular diseases are the third commonest cause of mortality, identification of risk factors will allow further studies in risk factor modification for the prevention of stroke.

Shaper (1991) in a cohort study of men done to determine the risk factors for stroke in a cohort representative of middle aged British men. The relative risk of stroke was 12.1 in men who had high blood pressure (systolic blood pressure greater than or equal to 160 mm Hg) and were current smokers compared with normotensive, non-smoking men. Diastolic blood pressure yielded no additional information, and former cigarette smokers had the same risk as men who had never smoked. Systolic blood pressure, cigarette smoking, and left ventricular hypertrophy on electrocardiography in men with pre-existing ischaemic heart disease were found to be the major risk factors for stroke in middle aged British men. A large proportion of strokes should be preventable by controlling blood pressure and stopping smoking.

The researcher noticed in this part that hemiplegia incident differ geographically but has high incidence in general. Also it has been noticed that there are different risk factors that can increase the risk of having hemiplegia which also differ geographically.

3.2. Studies related to hemiplegia psychological and physical dysfunctions:

Hamer et al (2010) has measured levels of psychological distress using the 12-item General Health Questionnaire and collected blood pressure, data on history of hypertension diagnosis, and medication usage. Awareness of hypertension was confirmed through a physician diagnosis or the use of antihypertensive medication, and unaware hypertension was defined by elevated clinic blood pressure (systolic/diastolic _140/90 mm Hg) without previous treatment or diagnosis. In comparison with normotensive participants, an elevated risk of distress (General Health Questionnaire score _4) was observed in aware hypertensive participants (multivariable adjusted odds ratio: 1.57 [95% CI: 1.41 to 1.74]) but not in unaware hypertensives (odds ratio: 0.91 [95% CI: 0.78 to 1.07]). Antihypertensive medication and comorbidity were also associated with psychological distress, although this did not explain the greater risk of distress in aware hypertensives. We observed a weak curvilinear association between systolic blood pressure and distress, which suggested that distressed participants were more likely to have low or highly elevated blood pressure. These findings suggest that labeling individuals as hypertensive, rather than having elevated blood pressure, per se, may partially explain the greater levels of distress in patients treated for hypertension.

Eman Taher et al (2010) Identified the factors which predict the outcome of stroke Egyptian patients in a hospital based prospective study included 220 patients with stroke. Data collection was carried out using a pretested questionnaire. The questionnaire was used to record the demographic data, clinical data, the pre hospital delay. Neurological examination with special emphasis on the muscle power was done. The patients were followed up till their time of discharge to record the length of hospital stay, and the functional outcome at time of discharge which was assessed by modified Rankin Scale (MRS) .The mean age of the studied patients was 59.8± 13.2, males constituted 64.1%. Hypertension was the main co morbidity detected in 65%. The degree of weakness of the patient recorded complete paralysis in 6.8%. The median prehospital delay was 6 hours,, while median the length of hospital stay was 6 days. 53.2% were independent according to MRS (good outcome) and 46.3% were dependent (bad outcome). Forward logistic regression analysis demonstrated that motor weakness, older age, female sex and prehospital delay were the only significant predictors with prediction change in the odds equal (12.9, 7.8, 2.6,4.6 respectively). Our data confirmed that old age, female sex, pre hospital delay, lower manual muscle strength testing score were the independent predictor of poor outcome in Egyptian stroke patients.

Grimsrud et al (2009) examined the association between hypertension and depression and anxiety in South Africa.The Composite International Diagnostic Interview was used to measure DSM-IV mental disorders during the previous 12-months. The relationships between self reported hypertension and anxiety disorders, depressive disorders and comorbid anxiety-depression were assessed after adjustment for participant characteristics including experience of trauma and other chronic physical conditions. Overall 16.7% reported a previous medical diagnosis of hypertension, and 8.1% and 4.9% were found to have a 12- month anxiety or depressive disorder, respectively. In adjusted analyses, hypertension diagnosis was associated with 12- month anxiety disorders [Odds ratio (OR) = 1.55, 95% Confidence interval (CI) = 1.10–2.18] but not 12-month depressive disorders or 12-month comorbid anxiety-depression. Hypertension in the absence of other chronic physical conditions was not associated with any of the 12-month mental health outcomes (p-values all ,0.05), while being diagnosed with both hypertension and another chronic physical condition were associated with 12-month anxiety disorders (OR = 2.25, 95% CI = 1.46–3.45), but not 12-month depressive disorders or comorbid anxiety-depression.

Shirley (2008) reported that expressive communication impairment and dependence in personal activities of daily living were significant predictors of emotional distress at one month after stroke (R2=24%). Expressive communication impairment, emotional distress at one month after stroke (R2=55%). Distress levels were similar at one month and 6 months after stroke. Demographic characteristics and side of lesion were unrelated to distress.

Karatepe et al (2008) has evaluated the incidence of comorbid diseases and their impact on functional outcome in patients after stroke. A total of 140 patients after stroke was included in the study. Comorbidities were assessed with the Liu comorbidity index. Functional independence was evaluated using the Functional Independence Measure (FIM). The relationship between comorbidities and functional outcomes were investigated. The impact of comorbidities on functional outcome was examined with multiple stepwise regression analysis. Ninety-four (67%) of 140 patients completed the study. The most frequent comorbid condition was hypertension at the initial visit. The weighted comorbidity index at baseline was negatively correlated with the follow-up FIM score and functional gain. Multiple regression analysis revealed that follow-up FIM score could be best explained by FIM at admission and the contribution of the weighted comorbidity index to functional outcome was 3.1%.

Paile-Hyvärinen et al (2007) studied the independent effects of diabetes mellitus (DM) and cardiovascular disease (CVD) on the prevalence of depression and to examine low birth weight as a possible common explanatory factor. Depressive symptoms were more prevalent among subjects with diabetes (23.5%) than among those with normal glucose tolerance (16.6%) ($P < 0.001$). A history of CVD also markedly increased the odds of having depressive symptoms (odds ratio (OR) = 2.38, 95% confidence interval (CI) = 1.70-3.32, $P < 0.001$). The association between DM and depressive symptoms was, however, rendered non-

significant when adjusting for the presence of CVD. Being born with a low birth weight doubled the risk for having depressive symptoms (OR = 2.64, 95% CI = 1.42-4.91, P = 0.002) and magnified the association between CVD/DM and depression.

Singh et al (2006) conducted a study in 50 hemiplegic patients with a minimum of 3 months duration to find out any association of psychiatric morbidity in hemiplegics by using the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) and Present State Examination (PSE). Depression was found in 24%, anxiety disorders in 26%, adjustment disorders in 12% and sexual dysfunction in 50% of the cases. Twenty-eight percent of the patients also had other psychiatric co morbidity. Early recognition and treatment of such problems in stroke patients will certainly help in the early recovery.

Tang et al (2005) attempted to evaluate the psychosocial, clinical, and radiological predictors of (PSD) in Chinese patients. One hundred eighty-nine patients participated in the study. Three months after the index stroke, a psychiatrist administered the Structured Clinical Interview for *DSM-IV* to all of the patients and made a *DSM-IV* diagnosis of depression. In addition, a host of demographic, clinical, and radiological variables were examined. Thirty-one (16.4%) of the patients had a diagnosis of PSD that included major depression (n = 11, 5.8%,), minor depression (n = 16, 8.5%), or dysthymia (n = 4, 2.1%). Univariate analysis revealed that PSD was associated with female gender, a lower level of education, a lower Lubben Social Network Scale score, subcortical infarcts, and lesions in the ACA territory, and the Modified Life Event Scale score was borderline for statistical significance. Multivariate logistic regression analysis suggested that female gender, a high Modified Life Event Scale score, and subcortical and ACA lesions were independent risk factors for PSD and that a high Lubben Social Network Scale score was a protective factor.

Angelelli (2004) reported that wide range of neuropsychiatric symptoms was found significant in the poststroke population: mostly depression (61%), irritability (33%), eating disturbances (33%), agitation (28%), apathy (27%) and anxiety (23%). Modifications in terms of greater depression, anxiety, irritability and eating disturbances evolved in the year following stroke. Other symptoms were significantly present depending on time from stroke.

A prospective, multicenter study was performed to determine the frequency of symptomatic complications up to 30 months after stroke using pre specified definitions of complications. Complications during hospital admission were recorded in 265 (85%) of stroke patients. Specific complications were as follows: neurological—recurrent stroke (9% of patients), epileptic seizure (3%); infections—urinary tract infection (24%), chest infection (22%), others (19%); mobility related—falls (25%), falls with serious injury (5%), pressure sores (21%);

thromboembolism—deep venous thrombosis (2%), pulmonary embolism (1%); pain—shoulder pain (9%), other pain (34%); and psychological—depression (16%), anxiety (14%), emotionalism (12%), and confusion (56%). During follow-up, infections, falls, "blackouts," pain, and symptoms of depression and anxiety remained common. Complications were observed across all 3 hospital sites, and their frequency was related to patient dependency and duration after stroke. This cohort study has confirmed that poststroke complications, particularly infections and falls, are common. However, we have also identified complications relating to pain and cognitive or affective symptoms that are potentially preventable and may previously have been underestimated. Langhorne (2003)

Berge et al (2003) followed 100 patients for 18 months after stroke. Depressive symptoms were assessed at 2 weeks and 2,6,12, and 18 months after stroke with the Beck depression inventory and the Hamilton Rating Scale for depression. In all, 54% of patients felt at least mildly depressive at 12 and / or 18 months. Only 12% of patients were depressive for the first time at 12 or 18 months. The male sex was associated with a more negative change in depressive symptoms during the first 2 months, stroke severity from 6 to 12 months, and the male sex at 18 months. Depressive symptoms were unrelated to the lesion location.

Study was done by Carod-Artal, (2003) showed that quality of life (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).

Martin (2000) in a study to describe the emotional outcomes among a cohort of patients which was of sufficient size to provide a precise estimate of their frequency and help identify those factors which are associated with poor outcomes after an acute stroke. 372 surviving patients, who had been referred to a hospital and entered into a randomized trial to evaluate a stroke family care worker, were asked to complete questionnaires at a 6 month follow up. These included measures of emotional distress (general health questionnaire 30 items, (HAD) hospital anxiety and depression scale) and physical functioning (modified Rankin, Barthel index). A regression analysis was used to identify factors which were independently associated with poor outcomes. 184 (60%) surviving patients scored more than 4 on the GHD anxiety (22%) more than 8 on the HAD anxiety subscale, and 49 (20%) more than 8 on the HAD depression subscale . Patients with ability were more likely to be depressed whereas there was a less strong relation between disability and anxiety. Patients with posterior

circulation outcomes than those with posterior circulation strokes had consistently better emotional outcomes than those with anterior circulation strokes.

Kauhanen (1999) reported that depression was diagnosed in 53% of the patients at 3 months and in 42% of the patients at 12 months after the stroke. The prevalence of major depression was 9% at 3 months and 16% at 12 months. There was an association between post stroke depression and cognitive impairment; the domains most likely to be defective in stroke –related depression were memory (P=0.022), nonverbal problem solving (P=0.039), and attention and psychomotor speed (P=0.020). The presence of dysphasia increased the risk of major depression. The depressive patients were more dependent in ADL and had more severe impairment and handicap than the non depressive patients.

Monica (1996) reported that the prevalence of GAD after stroke was 28% in the acute stage, and there was no significant decrease through the 3 years of follow-up. At 1 year, only 23% of the patients with early GAD (0 to 3 months) had recovered; those not recovered at this follow-up had a high risk of a chronic development of the anxiety disorder. At the acute stage after stroke, GAD plus depression was associated with left hemispheric lesion, whereas anxiety alone was associated with right hemispheric lesion. Dependence in activities of daily living and reduced social network were associated with GAD at all follow-up periods except at the acute stage.

Andersen et al (1995) did a cohort study of 285 stroke patients, median age 69 years, for correlation between potential risk factors and the 1-year incidence of PSD. The following factors correlated significantly with PSD: a history of previous stroke, a history of previous depression, female gender, living alone and social distress prestroke. Further, social inactivity, decrease in social activity, pathological crying and intellectual impairment at 1 month but not functional outcome correlated to PSD. A multivariate regression analysis showed that intellectual impairment explained 42% of variance of mood score. Major depression was unrelated to lesion location. We conclude that etiology to PSD is a complex mixture of prestroke personal and social factors, and stroke induced social, emotional and intellectual handicap.

Astrom (1992) designed a study to describe different aspects of psychosocial function after stroke and the development of changes over time. A major aim has been to identify mental, functional, and social factors associated with low life satisfaction late after stroke. Social network, functional ability, leisure-time activities, experience of ill health, major depression, and life satisfaction were assessed repeatedly over 3 years in a population-based sample of 50 long-term survivors of stroke (mean age 71.4 years). Compared with a general elderly population, patients 3 years poststroke had more psychiatric symptoms, lower functional ability, and reduced life satisfaction. Contacts with children were maintained over the 3-year follow-up period, whereas contacts with friends and

neighbors declined early after stroke and remained lower than in the general elderly population ($p<0.05$). When time dependency was analyzed, activities of daily living and somatic/neurological symptoms were found to change little after 3 months, while psychiatric symptoms showed changes later. Between 3 and 12 months poststroke, the prevalence of major depression decreased, leisure-time activities and social contacts were partly resumed, and life satisfaction improved ($p<0.01$). Once good life satisfaction was restored it was maintained, and poor life satisfaction at 1 year remained poor for the entire 3 years.

Beckson, M and Cummings, J. (1991) reported that neuropsychiatric disorders following stroke are common, and pathologic involvement of specific regions or functional systems results in behavioral syndromes similar to idiopathic psychiatric syndromes. Depression occurs in up to half of all stroke patients and is most frequently associated with left anterior cortical and subcortical infarctions. Mood changes interfere with cognitive, functional and social recovery. Mania, delusions, hallucinations, personality alterations, obsessive-compulsive disorder, and changes in sexual behavior are less common but have also been described in post-stroke patients. Each behavioral syndrome is associated with a specific pattern of brain involvement. Investigation of these phenomena contributes to understanding the cerebral basis of psychiatric disorders.

Carlton et al (1991) used the Minnesota Multiphasic Personality Inventory to examine the psychological adjustment of 98 patients (mean age 54.7 yrs) who had cerebrovascular accidents (strokes) within 2.5 yrs of testing . Depression and somatization were prevalent in their profiles = (mean code type: 21′), with greater depression in patients who had right hemisphere damage. However, when a 21-item correction index was applied to remove response variance due to bona fide stroke symptoms, results indicated a significant reduction in scores that suggested somatization and hysterical features .

Magni and Schifano (1984) done study aimed to evaluate the presence of both depression and other emotional disturbances which may represent specific psychological reactions to stroke; differences between patients who have recently undergone a stroke and those in whom the injury occurred some time ago were also examined. The study was carried out on 30 consecutive patients with unequivocal evidence of CVA with resultant hemiplegia. The sample included: 16 men and 14 women, mean age 68-6 years (SD 10-8); 15 were married, 13 widowers/widows and two never married. Psychological distress was evaluated with the Symptom Distress Checklist (SCL-90) . The stroke subjects obtained higher scores than the controls on the OC, depression and sleep disturbances subscales. Focusing on the frequency distribution rather than mean scores we can see that, on many of the subscales, more than 70% of both patients and controls obtained a score of less than 1, indicating minimal levels of psychological distress in these symptom complexes. Moderate (scores of between 1 and 2) to high (scores of more than 2) levels of psychological distress were reported by more than

30% of the stroke patients on subscales: sleep disturbances (66%), depression (63%), OC (46%) and somatization (40%), and by more than 30% of the controls on the subscales: sleep disturbances (53%) and depression (37%). On exclusion of the somatization subscale, whose scores may be influenced by the somatic symptoms of the disease, it can be seen that the stroke patients report a higher degree of psychological distress on the subscales measuring obsessiveness-compulsiveness and sleeping disturbances. As for the OCD, whose values are rather high and hence indicate a fairly characteristic pattern, it should be noted that while the scale mainly measures clearly obsessive-compulsive symptoms such as the inability to get rid of undesired thoughts, words or ideas, the need to check and double check what is done, etc, it also contains questions aimed to evaluate more general cognitive difficulties and could hence be influenced, in the stroke group, by organic symptoms due to the lesion to the CNS.

The researcher noticed in this part that there are many psychological reactions to hemiplegia and the commonest reaction was depression followed by anxiety. It has been noticed also that these reactions occurs mostly due to bad physical condition of those patients

3.3. Studies related to rehabilitation effect on hemiplegia:

Rehabilitation plays an important role in the treatment of hemiplegic patient and changes his/her life because rehabilitation interferes with patient, family members, care giver and the patient's environment that is why it is important for the hemiplegic patient to be rehabilitated in order to reduce the hemiplegia effects that he/she suffers.

Cumming et el (2008) concluded that very early mobilization may reduce depressive symptoms in stroke patients at 7 days post-stroke after evaluating the effect of very early mobilization after stroke on levels of depression, anxiety and irritability. They used a randomized controlled trial; patients in the very early mobilization group receive mobilization earlier (within 24 h of stroke) and more frequently than patients in the standard care group. At 7 days, very early mobilization patients were less depressed ($z = 2.51$, $p = 0.012$) and marginally less anxious ($z = 1.79$, $p = 0.073$) than standard care. very early mobilization was associated with a reduced likelihood of depression at 7 days (odds ratio 0.14, 95% confidence interval 0.03–0.61; $p = 0.009$).

Legg et al (2006) reported that when occupational therapy delivered to patients after stroke and targeted towards personal activities of daily living increased performance scores (standardized mean difference 0.18,95% confidence interval 0.04 to 0.32, P=0.01) and reduced the risk of poor outcome (death, deterioration of dependency in personal activities of daily living) (odds ration 0.67, 95% confidence interval 0.51 to 0.87, P=0.003) . For every 100 people who received occupational therapy focused on personal activities of daily living, 11 (95% confidence interval 7 to 30) would be spared a poor outcome. Occupational therapy focused on improving personal activities of daily living after

stroke can improve performance and reduce the risk of deterioration in these disabilities.

Landi et a (2006) evaluated the efficacy of occupational therapy programs in patients with a recent stroke. Overall, patients had a moderate-to-severe impairment in basic activities of daily living; the mean ADL score was 30.8 (SD 8 7.8) in the intervention group and 30.7 (SD 8 6.1) in the control group ($p = 0.9$). After 8 weeks of treatment the mean ADL score in the intervention group was 13.2 (SD 8 9.9) compared to 20.3 (SD 8 11.5) in the control group ($p = 0.02$). Differences between the intervention and control groups were statistically signify cant for transfers (+2.8 vs. +1.6 points on the ADL scale, $p = 0.006$), locomotion (+3.4 vs. +1.7 points on the ADL scale, $p = 0.01$), dressing (+3.0 vs. +1.8 points on the ADL scale, $p = 0.01$) and self-care (+3.4 vs. +1.8 points on the ADL scale, $p = 0.005$). The results show that patients with stroke who received occupational therapy had a greater level of independence in activities of daily living over a period of 8 weeks than patients who did not.

In a randomized controlled trial (RCT) study in sub acute 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 a randomized controlled trial study to evaluate whether occupational therapy intervention can improve outdoor mobility after stroke or not.
primary outcome measure was response to whether participant got out of the house as much as he or she would like, and secondary outcome measures were response to how many journeys outdoors had been made in the past month and scores on the Nottingham extended activities of daily living scale, Nottingham leisure questionnaire, and general health questionnaire. Participants in the treatment group were more likely to get out of the house as often as they wanted at both four months (relative risk 1.72, 95% confidence interval 1.25 to 2.37) and 10 months (1.74, 1.24 to 2.44). The treatment group reported more journeys outdoors in the month before assessment at both four months (median 37 in intervention group, 14 in control group: $P < 0.01$) and 10 months (median 42 in intervention group, 14 in control group: $P < 0.01$). At four months the mobility scores on the Nottingham extended activities of daily living scale were significantly higher in the

intervention group, but there were no significant differences in the other secondary outcomes. No significant differences were observed in these measures at 10 months. A targeted occupational therapy intervention at home increases outdoor mobility in people after stroke. (Logan 2004)

Dogan et al (2004) did a study to determine whether or not there was an improvement in the daily life activities and ambulation levels of the hemiplegic patients who went under a rehabilitation program. 92 hemiplegic patients were included in the rehabilitation program. The ages, genders, educational levels, etiologies, hemiplegic sides, hemiplegic periods and the systemic diseases of the patients included in the rehabilitation program were recorded. The daily life activities of every patient at admittance and at discharge from hospital were evaluated using the Barthel Index and ambulation levels were evaluated using the Functional Ambulation Scale . The average Barthel Index of the patients at admittance was 44.3 ± 23.3 and the average Barthel Index of the patients at discharge was 63.2 ± 25.4. Significance was determined by the t test results between the admittance and discharge Barthel Index values ($P < 0.01$). No statistically significant difference in BI values was determined among female and male patients between admittance and discharge ($P > 0.05$). According to the Functional Ambulation Scale levels, while 69 (74.9 %) patients were found to be at the Functional Ambulation Scale phase 0 and 1 levels on admittance to the hospital, 25 (27.1%) patients were found to be at the Functional Ambulation Scale phase 0 and 1 levels at discharge. While the number of patients at the phase 4 and 5 levels was 13 (14.1%) at admittance, this reached 52 (56.4%) at discharge. The hemiplegic patients whom we included in the rehabilitation program recorded a statistically significant improvement, both in their daily life activities and in their ambulation levels, at the end of an average 40-day hospitalization period. These results show the importance of a suitable rehabilitation program in the improvement of patients from the functional and motor aspects and for independent ambulation.

Fang et al (2003) investigated whether additional early physiotherapy after stroke improved functional recovery in stroke patients with first-onset stroke consecutively admitted to the stroke centre. One group (n = 78) received additional early physiotherapy for 45 minutes, five days a week for four weeks starting within the first week since stroke onset; the routine therapy group (n = 78) received no professional rehabilitation therapy. Patients from the additional early physiotherapy group had a high drop-out rate (n = 28), but those remaining made relatively better functional recovery at 30 days than those from the routine therapy group if measured by Modified Barthel Index. It was concluded that additional early physiotherapy might improve independence of patients after stroke but failed to show benefit in other aspects in the study.

Wilma et al (2003) assessed changes in health related quality of life (HRQOL) during inpatient rehabilitation and again 6 months after discharge. HRQOL was assessed by means of the Medical Outcomes Study 36-item Short Form (SF-36). Dependent t tests were used to compare the scores at admission and discharge and at discharge and 6 months. Changes in HRQOL were calculated for

the period of admission to discharge and of discharge to the 6-month follow-up.Complete data were available for 85 patients. During rehabilitation, there were improvements in all 8 domains of the SF-36, with 5 attaining statistical significance. After discharge, 3 domains continued to improve, with 1 attaining statistical significance. However, there were marked and statistically significant declines in the other 5 domains of the SF-36. Feedback was obtained from a subset of the patients as to the reasons for these declines.

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.

Weiss et al (2000) evaluated the effects of a progressive resistance strength training program on changes in muscle strength, gait, and balance in older individuals 1 yr after stroke, seven individuals were recruited who were greater than 60-yr-old, 1 yr after stroke, living at home, and able to follow verbal commands. Lower limb strength improved 68% on the affected side and 48% on the intact side during training, with the largest increases observed for hip extension (affected side: 88%, $P < 0.01$; intact side: 103%, $P < 0.001$). Repeated chair stand time decreased 21% ($P < 0.02$). Motor performance assessed by the Motor Assessment Scale improved 9% ($P < 0.04$) and static and dynamic balance (Berg balance scale) improved 12% ($P < 0.004$). Progressive resistance training in individuals 1 yr after stroke improves affected and intact side lower limb strength and was associated with gains in chair stand time, balance, and motor performance.

Paolucci et al (2000) assessed the specific influence of onset-admission interval (OAI) on rehabilitation results. A case-control study in consecutive stroke inpatients, enrolled in homogeneous subgroups, matched for age (within 1 year) and Barthel Index score at admission, and different for OAI to the rehabilitation ward. The short OAI group began rehabilitation treatment within the first 20 days from stroke, medium OAI group between days 21 and 40, and long OAI between days 41 and 60. The short OAI subgroup had significantly higher effectiveness of treatment than did the medium ($p < .05$) and the long OAI groups ($p < .005$). Beginning treatment within the first 20 days was associated with a significantly high probability of excellent therapeutic response (OR = 6.11; 95% confidence interval [CI], 2.03-18.36), and beginning later was associated with a similar risk of poor response (OR = 5.18; 95% CI, 1.07-25.00). On the other hand, early intervention was associated with a five times greater risk of dropout than that of patients with delayed start of treatment (OR = 4.99; 95% CI, 1.38-18.03). The three subgroups were significantly ($p < .05$) different regarding the percentage of low and high responders.

Henrik (2000) reported that treatment and rehabilitation were given in general neurological and medical wards (GW), and in single large SU. Outcome measures were initial, 1-year, and 5-year mortality rates, a poor outcome (initial death or discharge to a nursing home), and length of hospital stay (LOHS). Multivariate regression analyses were used to examine the independent effect of SU treatment on the various subgroups. The aim of study was to examine if beneficial effects of treatment and rehabilitation are limited to certain groups of patients or if they apply to all patients independent of age, sex, co morbidity, and initial stroke severity. The results clarified that the relative risks of initial death, poor outcome, and 1-year and 5-year mortality rates were reduced by 40% on average in patients treated in the SU compared with the GW. A beneficial effect of SU treatment was observed regardless of the patient's age, sex, co morbidity, and initial stroke severity. Those who benefited most appeared to be the patients with the most severe strokes (poor outcome: OR 0.17; 95% CI 0.05 to 0.58). Those who benefited least were patients with mild or moderate strokes (poor outcome: OR 0.66; 95% CI 0.41 to 0.98) and patients <75 years of age (poor outcome: OR 0.66; 95% CI 0.36 to 1.19). LOHS was reduced by 2 to 3 weeks in all who had their treatment in the SU except in patients with the most severe strokes. LOHS in these patients was similar to LOHS in the GW. A beneficial effect of treatment in a SU is achieved in completely unselected patients independent of their age, sex, co morbidity, and stroke severity. Those who had the most severe strokes appeared to benefit most. All patients with acute stroke should therefore have access to treatment and rehabilitation in a dedicated SU.

Marion (1999) done a study to evaluate the effect of occupational therapy on the disability and handicap experienced by stroke patients who remain in the community in randomized control trial. The main aim of treatment was independence in personal and extended activities of daily living. Patients were also encouraged to participate in leisure activities. Significant differences were found between the groups at six months after stroke on the Barthel Index (p=0.002, 95% CI 0 to 1), Nottingham Extended Activities of Daily Living (p=0.009, 95% CI 1 to 4), Rivermead Gross Function (p=0.004, 95% CI 0 to 2), Caregiver Strain Index (p= 0.02, 95% CI 0 to 2) and the London Handicap Scale (p=0.03, 95% CI 0.3 to 13.5). The study demonstrated that occupational therapy significantly reduced the level of disability and handicap experienced by stroke patients who remained in the community and also significantly reduced the strain of the carer.

Britta et al (1999) reported that out of 100 subjects rehabilitated at a specialized geriatric stroke ward after the acute phase, 47 survivors were assessed in their homes 3 years after discharge and interviewed regarding their psychological well-being with the Philadelphia Geriatric Center Morale Scale, sixty-four percent of the subjects were classified as having high scores for psychological well-being or fell within the middle range. In a cluster analysis, depression was shown to have the strongest association with the subjects' Philadelphia Geriatric Center Morale Scale 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 Philadelphia Geriatric Center Morale Scale.

The strong association between Philadelphia Geriatric Center Morale Scale scores and depression indicates the importance of detecting and treating depression and of following up initiated therapy after stroke.

Kwakkel et al (1997) did a research synthesis to (1) critically review controlled studies evaluating effects of different intensities of stroke rehabilitation in terms of disabilities and impairments and (2) quantify patterns by calculating summary effect sizes. The effects of different intensities of rehabilitation were studied in nine controlled studies involving 1051 patients. Analysis of the methodological quality revealed scores varying from 14% to 47% of the maximum feasible score. Meta-analysis demonstrated a statistically significant summary effect size for activities of daily living (0.28±0.12). Lower summary effect sizes (0.19±0.17) were found for studies in which experimental and control groups were treated in the same setting compared with studies in which the two groups of patients were treated in different settings (0.40±0.19). Variables defined on a neuromuscular level (0.37±0.24) showed larger summary effect sizes than variables defined on a functional level (0.10±0.21). Weighting individual effect sizes for the difference in amount of rehabilitation between experimental and control groups resulted in larger summary effect sizes for activities of daily living and functional outcome parameters for studies that were not confounded by organizational setting.

Jubya et al (1996) has compared the outcome of patients receiving rehabilitation on a stroke unit (SU) with that of patients on general medical and health care of the elderly wards (conventional wards; CWs) in a randomised control trial. Of the 315 stroke patients admitted to hospital, 176 were randomly allocated to the SU and 139 to CWs. Outcome was assessed on the Barthel Index, Rivermead Activities of Daily Living Scale (ADL), Nottingham Extended ADL scale, General Health Questionnaire, Mood Ratings and Adjustment scales at 3, 6, and 12 months after stroke by an assessor who was 'blind' to their group allocation. SU patients spent significantly longer in hospital. There was a significant difference in personal ADL at 3 and 6 but not 12 months after randomisation. On measures of extended ADL, SU patients were significantly more independent at 6 and 12 months but not at 3 months after randomisation. There were no significant differences between the groups in mood at 3 and 6 months, but SU patients showed better mood 12 months after randomisation. There was a significant difference in adjustment 6 months after randomisation. Patients who received rehabilitation on SUs were more independent in activities of daily living compared with those who received rehabilitation on CWs. By 6 months they were also psychologically more able to cope.

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).

Dam et al (1993) has investigated, in a selected group of poststroke patients, the profile of recovery in response to long-term rehabilitation therapy. Fifty-one hemiplegic subjects unable to walk 3 months after stroke were enrolled in this study. Patients underwent consecutive periods of rehabilitation up to 2 years after the CVA. Autonomy in daily living activities and the degree of neurological compromission were periodically assessed with the Barthel Index and a neurological scale designed for hemiplegic subjects. The main features of the patients were also evaluated as a possible predictor of outcome. In a consistent percentage of the patients, significant gains in gait and daily living abilities were observed during the first year and, in individual cases, during the second year after stroke. At the end of the study, 74% of the patients regained their capacity to walk without assistance, and up to 79%71 had a Barthel Index score above 70. Sphincter function, level of neurological impairments, and capacity in daily living activities are significantly related to the outcome of the patients as a whole but were not useful to anticipate the outcome of each patient. These results suggest that disabled poststroke subjects may attain significant functional improvements in response to prolonged restorative therapy. However, the possibility of predicting the outcome of individual patients appears the major problem to solve in order to assign to long-term rehabilitation programs only patients who will benefit from the therapy.

It is clear from the previous researches that rehabilitation in general has positive role in reducing the psychological and physical consequences of hemiplegia. in comparison with the current study in order to reach this optimal level, rehabilitation should be commenced directly after being hemiplegic with enough period of rehabilitation to allow for follow up.

CHAPTER FOUR

STUDY DESIGN 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

- All hemiplegics due to stroke (males and females) who underwent rehabilitation treatment at the period from 1-1-2005 to 31-12-2010

- The total number of patients that underwent rehabilitation treatment is 326.

- The research included 163 hemiplegic patients

4.2.1. Inclusion criteria:

The following criteria must be present: Participants

- Able and agree to give consent

- Had been diagnosed hemiplegia due to stroke.

- Had received rehabilitation

4.2.2. Exclusion criteria:

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

4.3. Sampling:

A systematic random sample was used in this study. A lists of the rehabilitated hemiplegic patients was collected from national center for community rehabilitation (Gaza and Khanyounes) and from UNRWA physiotherapy clinics (Gaza and Khanyounes). These lists was gathered in one list, spaced interval 2 was picked and every 2nd name was picked from the starting number two. A total of 163 patients was chosen from the population to be the sample.

4.4. Data collection:

Data was collected from the national center for community rehabilitation in Gaza city (this center covers Gaza city and north) and Khanyounes city (this center covers south areas) as well as UNRWA physiotherapy centers (Gaza and Khanyounes) by the researcher and by trained 4 assistants. 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-36 (SF-36)

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 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.

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 .

The 10-item Physical Functioning sub-scale (PF10) is of specific interest for application in rehabilitation because of its focus on physical disability (Haley et al 1994), measured at the level of activity according to the International Classification of Functioning (WHO 2001) which will be the focus of the present study including the role limitation due physical health to measure the physical dysfunctions.

4.5.2. Mental Health Questionnaire (SCL –90- R) :

The SCL-90-R was used to measure the psychological dysfunctions. This scale is a 90-item self-report system inventory developed in the 1980s by Derogatis and designed to reflect the psychological symptom patterns of community, medical and psychiatric respondents. The scale was translated and adapted to the Palestinian environment by Abu Hien (1992), by calculating the scale validity.

The SCL-90-R consist of 90 items which rated on a five-point scale of distress (0-4) ranging for “not at all” to “extremely.” The scale consists of nine primary symptom dimensions: somatization, obsessive compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism; in addition to the tenth symptom dimension which call additional item.

1- Somatization : This dimension consists of 12 items and the number of these items on the mental health scale (SCL-90-R) are (1,4,12,27,40,42,48,49,52,53,56,58).

2- Obsessive Compulsive : This dimension consists of 10 items and the number of these items on the mental health scale (SCL-90-R) are (3,9,10,28,38,45,46,51,55,65).

3- Interpersonal Sensitivity : This dimension consists of 9 items and the number of these items on the mental health scale (SCL-90-R) are (6,21,34,36,37,41,61,69,73).

4- Depression : This dimension consists of 13 items and the number of these items on the mental health scale (SCL-90-R) are (5,14,15,20,22,26,29,30,31,32,54,71,79).

5- Anxiety : This dimension consists of 10 items and the number of these items on the mental health scale (SCL-90-R) are (2,17,23,33,39,57,72,78,80,86).

6- Hostility : This dimension consists of 6 items and the number of these items on the mental health scale (SCL-90-R) are (11,24,63,67,74,81).

7- Phobic Anxiety : This dimension consists of 7 items and the number of these items on the mental health scale (SCL-90-R) are (13,25,47,50,70,75,82).

8- Paranoid Ideation : This dimension consists of 6 items and the number of these items on the mental health scale (SCL-90-R) are (8,18,43,68,76,83).

9- Psychoticism : This dimension consists of 10 items and the number of these items on the mental health scale (SCL-90-R) are (7,16,35,62,77,84,85,87,88,90).

10- Additional Items : This dimension consists of 7 items and the number of these items on the mental health scale (SCL-90-R) are (19,44,59,60,64,66,89).

4.6. Ethical considerations

- Approval from national rehabilitation center for community rehabilitation and UNRWA head quarter to apply this study.
- Written covering letter and informal consent forms were obtained from each patient. (**Appendix 9**)

4.7. Period of the whole study

- Starting month is Apr. 2010
- Finishing month is June. 2011

4.8. Setting

This research was conducted at national rehabilitation center for community rehabilitation (Gaza and Khanyounes) and UNRWA physiotherapy centers (Gaza and Khanyounes)

4.9. 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 different variables 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%)

4.10. Limitation of the study

This study has some limitations.

- Loss of many subjects from the sample.
- Limited available resources and literature such as journals and books.
- Inclusion of risk factors in the study.

CHAPTER FIVE

RESULTS

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 hypothesis. General results of the demographic forma will be viewed and then the hypothesis answers will be viewed.

5.2. Socio-demographic results of the study:

5.2.1. Gender:

Table No. (5.2) shows that the total numbers of hemiplegic sample selected for the current study were 163 of all hemiplegic patients in Gaza Strip.

The higher number of the study sample 96 were males and represented (58.9%), and the lower number 67 were female and represented (41.1%). The study sample was taken from two geographical areas in Gaza Strip first is Gaza city which represents the north side and the second is khanyounes which represents the south side.

Table No. (5.2): sample gender distribution

Gender	Frequency	Percent
Male	96	58.9
Female	67	41.1
Total	163	100.0

5.2.2. Age:

Table No.(5.3) shows that 11.7% of the sample are of "5 - less than 20 years old", 24.5% of the sample are of "20 – less than 30 years old" , 12.9% of the sample are of "30 – less than 40 years old" and 50.9% of the sample are " 40 years and Older "

Table No.(5.3): sample age distribution

Age	Frequency	Percent
5 - less than 20	19	11.7
20 - less than 30	40	24.5
30 - less than 40	21	12.9
40 and older	83	50.9
Total	163	100.0

5.2.3. Marital status:

Table No.(5.4) shows that 27.6% of the sample are single, 57.7% are married , 2.5% are Divorce and 12.3% are Widow.

Marital Status	Frequency	Percent
Single	45	27.6
Married	94	57.7
Divorce	4	2.5
Widow	20	12.3
Total	163	100.0

5.2.4. Educational level:

Table No.(5.5) shows that 22.7% of the sample are not educated, 23.9% of the sample are at" Elementary " level, 32.5% of the sample are at " Secondary " level, and 20.9% of the sample are at " Colleague " level.

Table No.(5.5): sample educational level distribution

Educational level	Frequency	Percent
Without	37	22.7
Elementary	39	23.9
Secondary	53	32.5
Colleague	34	20.9
Total	163	100.0

5.3. Hemiplegia risk factors:

There are many risk factors for hemiplegia, the researcher studied only two non modifiable risk factors (gender and age) which also counted as demographic factors and five modifiable risk factors (smoking, hypertension, diabetes mellitus, Hyperlipidemia and psychological stresses).

5.3.1. Gender risk factor:

Table No.(5.6) shows that the higher number of the study sample 96 were males and represented (58.9%), and the lower number 67 were female and represented (41.1%).

Gender	Frequency	Percent
Male	96	58.9
Female	67	41.1
Total	163	100.0

5.3.2: age risk factor:

Table No.(5.7) shows that 11.7% of the sample are of "5 - less than 20 years old", 24.5% of the sample are of "20 – less than 30 years old" , 12.9% of the sample are of "30 – less than 40 years old" and 50.9% of the sample are " 40 years and Older "

Table No.(5.7) age risk factor

Age	Frequency	Percent
5 - less than 20	19	11.7
20 - less than 30	40	24.5
30 - less than 40	21	12.9
40 and older	83	50.9
Total	163	100.0

5.3.3: hypertension risk factor:

The results shows that 33.1% of the sample are having hypertension and 66.9% are not having hypertension.

Table No.(5.8) shows that the duration that patients have hypertension ranges from 3 years to 9 years with mean of 4.58 years and standard deviation of 1.66 years. 29.6 % of the sample have hypertension from 3 years, 31.5% of the sample have hypertension from 4 years, 16.7% of the sample have hypertension from 5 years, 7.4% of the sample have hypertension from 6 years, 5.6% of the sample have hypertension from 7 years, 5.6% of the sample have hypertension from 8 years and 3.7% of the sample have hypertension from 9 years.

Table No.(5.8) hypertension duration

when you had hypertension?	Frequency	Percent
3	16	29.6
4	17	31.5
5	9	16.7
6	4	7.4
7	3	5.6
8	3	5.6
9	2	3.7
Total	54	100.0

5.3.4: diabetes mellitus risk factor:

The results shows that 19.0% of the sample are having diabetes mellitus and 81.0% are not having diabetes mellitus.

Table No.(5.9) shows that the duration that patients have diabetes mellitus ranges from 1 years to 10 years with mean of 5.31 years and standard deviation of 2.71 years. 6.5% of the sample have diabetes mellitus from 1 year, 6.5% of the sample have diabetes mellitus from 2 year, 16.1% of the sample have diabetes mellitus from 3 year, 12.9% of the sample have diabetes mellitus from 4 year, 16.1% of the sample have diabetes mellitus from 5 year, 12.9% of the sample have diabetes mellitus from 6 year, 9.7% of the sample have diabetes mellitus from 7 year, 6.5% of the sample have diabetes mellitus from 9 year, 12.9% of the sample have diabetes mellitus from 10 year.

Table No.(5.9) diabetes mellitus duration

when you had diabetes mellitus?	Frequency	Percent
1	2	6.5
2	2	6.5
3	5	16.1
4	4	12.9
5	5	16.1
6	4	12.9
7	3	9.7
9	2	6.5
10	4	12.9
Total	31	100.0

5.3.5: smoking risk factor:

The results shows that 39.9% of the sample are smokers and 60.1% are not smokers. Table No.(5.10) shows that 38.5% of the smokers are heavy smokers, 53.8% of the smokers are moderate smokers and 7.7% of the smokers are mild smokers.

how you describe yourself?	Frequency	Percent
Heavy smoker	25	38.5
moderate smoker	35	53.8
mild smoker	5	7.7
Total	65	100.0

5.3.6: Hyperlipidemia risk factor:

The results shows that 15.3% of the sample are having Hyperlipidemia and 84.7% are not having Hyperlipidemia.

5.3.7: psychological stresses risk factor:

The results shows that 52.8% of the sample are having psychological stresses and 47.2% are not having psychological stresses.

5.4.: SF-36 Health Survey Analysis:

5.4.1.: physical functioning domain:

In general for physical functioning domain, Table (5.11) shows that 17.3% of the respondents choose " No, not limited at all ", 37.5% choose " Yes, limited a little ", and 45.2% " choose Yes, limited a lot "

Table (5.11): physical functioning domain frequencies and percentage

physical functioning domain	Responses	
	N	Percent
No, not limited at all	279	17.3%
Yes, limited a little	605	37.5%
Yes, limited a lot	730	45.2%

Table (5.12) shows the following results:

- The mean of item1 “Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.”, equals 2.49 (82.92%), Sign Test-value = 7.40, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 2 . We conclude that the respondents opinion is " Yes, limited a lot" for this paragraph.
- The mean of item7 “Walking more than one mile.”, equals 2.44 (81.48%), Sign Test -value = 6.65, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 2 . We conclude that the respondents opinion is " Yes, limited a lot" for this paragraph.
- The mean of item10 “Bathing or dressing yourself” equals 2.09 (69.75%), Sign Test -value = 1.42, and P-value = 0.078 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different

from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "Yes, limited a little" for this paragraph.

- The mean of "physical functioning domain" equals 2.28 (75.96%), Sign Test -value = 6.28, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 2. We conclude that the respondents opinion is " Yes, limited a lot" for the "physical functioning domain "

Table (5.12): Means and Sign Test values for "physical functioning domain"

	Paragraph	Mean	Proportional mean	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.	2.49	82.92	0.67	7.40	0.000*	1
2.	Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?	2.33	77.57	0.70	5.28	0.000*	4
3.	Lifting or carrying groceries	2.22	73.91	0.75	3.45	0.000*	5
4.	Climbing several flights of stairs.	2.44	81.25	0.67	6.83	0.000*	3
5.	Climbing one flight of stairs.	2.19	73.08	0.75	3.05	0.001*	8
6.	Bending, kneeling or stooping.	2.20	73.29	0.75	3.16	0.001*	7
7.	Walking more than one mile.	2.44	81.48	0.71	6.65	0.000*	2
8.	Walking several blocks.	2.21	73.62	0.77	3.27	0.001*	6
9.	Walking one block.	2.19	72.92	0.75	2.96	0.002*	9
10.	Bathing or dressing yourself	2.09	69.75	0.77	1.42	0.078	10
	physical functioning domain	2.28	75.96	0.50	6.28	0.000*	

* The mean is significantly different from the hypothesized value 2

5.4.2.: role limitation due to physical health domain:

In general for the "role limitation due to physical health domain", the results are 22.5% agree (Yes) and 77.5% disagree (No).

Table (5.13) role limitation due to physical health frequencies and percentage:

Categories	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Cut down on the amount of time spent on work or other activities	24	14.7	139	85.3
Accomplished less than you would like	56	34.4	107	65.6
Were limited in the kind of work or other activities	32	19.6	131	80.4
Had difficulty performing the work or other activities	35	21.5	128	78.5

5.5.: mental health survey analysis:

5.5.1.: Somatization

In general for " Somatization ", Table (5.14) shows that 25.2% of the respondents choose " not at all ", 22.2% choose " a little bit ", 25.1% choose " Moderately ", 19.9% choose " quite a bit ", and 7.6% choose " Extremely ".

Table (5.14): Frequencies and Percentages for " Somatization "

Somatization	Responses	
	N	Percent
not at all	489	25.2%
a little bit	431	22.2%
Moderately	488	25.1%
quite a bit	386	19.9%
Extremely	147	7.6%

Analysis for each paragraph for " Somatization ".

Table (5.15) shows the following results:

- The mean of item11 “Feeling weak in parts of your body” equals 2.04 (51.07%), Sign Test-value = 0.36, and P-value = 0.358 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "moderately" for this paragraph.
- The mean of item6 “Soreness of your muscles” equals 1.72 (43.06%), Sign Test-value = -1.92, and P-value = 0.027 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.

- The mean of item3 “Pains in heart or chest” equals 1.38 (34.47%), Sign Test-value = -4.80, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of “Somatization” equals 1.63 (40.73%), Sign Test-value = -3.74, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for the field of “Somatization ".
- The percentage within one standard deviation above the mean for Somatization equals 10.43%.

Table (5.15): Means and Sign Test values for "Somatization"

	Paragraph	Mean	Proportional mean (%)	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Headaches	1.52	38.04	1.26	-4.26	0.000*	8
2.	Faintness or dizziness	1.64	40.99	1.23	-2.53	0.006*	6
3.	Pains in heart or chest	1.38	34.47	1.21	-4.80	0.000*	12
4.	Pains in lower back	1.72	43.01	1.29	-1.93	0.027*	4
5.	Nausea or upset stomach	1.68	42.08	1.23	-2.36	0.009*	5
6.	Soreness of your muscles	1.72	43.06	1.32	-1.92	0.027*	3
7.	Trouble getting your breath	1.41	35.28	1.24	-4.19	0.000*	10
8.	Hot or cold spells	1.59	39.66	1.29	-2.76	0.003*	7
9.	Numbness or tingling in parts of your body	1.43	35.65	1.26	-4.84	0.000*	9
10.	A lump in your throat	1.38	34.47	1.19	-5.32	0.000*	11
11.	Feeling weak in parts of your body	2.04	51.07	1.20	0.36	0.358	1
12.	Heavy feelings in your arms or legs	1.98	49.53	1.22	-0.19	0.425	2
	Somatization	1.63	40.73	0.83	-3.74	0.000*	

* The mean is significantly different from the hypothesized value 2

5.5.2: Obsessive Compulsive:

In general for " Obsessive Compulsive ", Table (5.16) shows that 22.4% of the respondents choose " not at all ", 21.3% choose " a little bit ", 24.9% choose " Moderately ", 20.6% choose " quite a bit ", and 10.7% choose " Extremely ".

Table (5.16): Frequencies and Percentages for " Obsessive Compulsive "

Obsessive Compulsive	Responses	
	N	Percent
not at all	362	22.4%
a little bit	344	21.3%
moderately	402	24.9%
quite a bit	332	20.6%
extremely	173	10.7%

Table (5.17) shows the following results:

- The mean of item2 “Trouble remembering things” equals 1.78 (44.48%), Sign Test-value = -1.62, and P-value = 0.052 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "moderately" for this paragraph.
- The mean of item5 “Having to do things very slowly” equals 2.35 (58.70%), Sign Test-value = -3.30, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of item3 “Worried about sloppiness or carelessness” equals 1.42 (35.56%), Sign Test-value = -4.73, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this

paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.

- The mean of “Obsessive Compulsive” equals 1.77 (44.18%), Sign Test-value = -2.51, and P-value=0.006 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for “Obsessive Compulsive ".
- The percentage within one standard deviation above the mean for obsessive compulsive equals 11.04%.

Table (5.17): Means and Sign Test values for "Obsessive Compulsive"

	Paragraph	Mean	Proportional mean (%)	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Unwanted thoughts or ideas that won't leave your head	1.51	37.65	1.26	-4.11	0.000*	9
2.	Trouble remembering things	1.78	44.48	1.31	-1.62	0.052	5
3.	Worried about sloppiness or carelessness	1.42	35.56	1.29	-4.73	0.000*	10
4.	Feeling blocked in getting things done	1.92	47.97	1.23	-0.28	0.389	2
5.	Having to do things very slowly	2.35	58.70	1.26	-3.30	0.000*	1
6.	Having to check and double check what you do	1.62	40.53	1.26	-2.89	0.002*	7
7.	Difficulty making decisions	1.73	43.13	1.29	-2.10	0.018*	6
8.	Your mind going blank	1.79	44.63	1.29	-1.51	0.065	4
9.	Trouble concentrating	1.88	46.93	1.29	-0.55	0.291	3
10.	Having to repeat the same actions such as touching , counting , washing	1.60	39.94	1.30	-2.91	0.002*	8
	Obsessive Compulsive	1.77	44.18	0.81	-2.51	0.006*	

* The mean is significantly different from the hypothesized value 2

5.5.3: Interpersonal Sensitivity:

In general for " Interpersonal Sensitivity ", Table (5.18) shows that 30.5% of the respondents choose " not at all ", 19.7% choose " a little bit ", 21.5% choose " Moderately ", 19.6% choose " quite a bit ", and 8.7% choose " Extremely ".

Table (5.18): Frequencies and Percentages for " Interpersonal Sensitivity "

Interpersonal Sensitivity	Responses	
	N	Percent
not at all	442	30.5%
a little bit	286	19.7%
moderately	312	21.5%
quite a bit	284	19.6%
extremely	126	8.7%

Table (5.19) shows the following results:

- The mean of item7 “Feeling uneasy when people are watching or talking about you” equals 1.87 (46.78%), Sign Test-value = -0.92, and P-value = 0.180 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "moderately" for this paragraph.
- The mean of item8 “Feeling very self-conscious with others” equals 1.71 (42.77%), Sign Test-value = -2.02, and P-value = 0.022 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of item9 “Feeling uncomfortable about eating or drinking in public ” equals 1.19 (29.84%), Sign Test-value = -6.23, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is

negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.

- The mean of the filed “Interpersonal Sensitivity” equals 1.57 (39.20%), Sign Test-value = -3.23 and P-value=0.001 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for the field of “Interpersonal Sensitivity ".
- The percentage within one standard deviation above the mean for interpersonal sensitivity equals 6.75%.

Table (5.19): Means and Sign Test values for "Interpersonal Sensitivity"

	Paragraph	Mean	Proportional mean (%)	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Feeling critical of others	1.51	37.73	1.38	-3.37	0.000*	7
2.	Feeling shy or uneasy with the opposite sex	1.50	37.50	1.28	-3.52	0.000*	8
3.	Your feelings being easily hurt	1.53	38.13	1.35	-3.19	0.001*	6
4.	Feeling others do not understand you or are unsympathetic	1.67	41.72	1.28	-2.23	0.013*	3
5.	Feeling that people are unfriendly	1.55	38.66	1.30	-3.17	0.001*	4
6.	Feeling inferior to others	1.53	38.36	1.41	-2.70	0.003*	5
7.	Feeling uneasy when people are watching or talking about you	1.87	46.78	1.35	-0.92	0.180	1
8.	Feeling very self-conscious with others	1.71	42.77	1.31	-2.02	0.022*	2
9.	Feeling uncomfortable about eating or drinking in public	1.19	29.84	1.24	-6.23	0.000*	9
	Interpersonal Sensitivity	1.57	39.20	0.98	-3.23	0.001*	

* The mean is significantly different from the hypothesized value 2

5.5.4: Depression:

In general for " Depression ", Table (5.20) shows that 26.7% of the respondents choose " not at all ", 19.5% choose " a little bit ", 23.4% choose " Moderately ", 19.1% choose " quite a bit ", and 11.3% choose " Extremely ".

Table (5.20): Frequencies and Percentages for the filed " Depression "

Depression	Responses	
	N	Percent
not at all	557	26.7%
a little bit	407	19.5%
moderately	490	23.4%
quite a bit	400	19.1%
extremely	236	11.3%

Table (5.21) shows the following results:

- The mean of item12 “Feeling everything is an effort” equals 2.24 (55.94%), Sign Test-value = 2.22, and P-value = 0.013 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 2 . We conclude that the respondents opinion is " quite a bit " for this paragraph.
- The mean of item2 “Feeling low in energy or slowed sown” equals 2.01 (50.16%), Sign Test-value = 0.00, and P-value = 0.500 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "moderately" for this paragraph.
- The mean of item11 “Feeling hopeless about the future” equals 1.71 (42.70%), Sign Test-value = -2.15, and P-value = 0.016 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this

paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.

- The mean of item3 “Thoughts of ending life” equals 1.25 (31.21%), Sign Test-value = -4.86, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of the filed “Depression” equals 1.70 (42.48%), Sign Test-value = -3.12, and P-value=0.001 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for the field of “Depression ".
- The percentage within one standard deviation above the mean for depression equals 12.88%.

Table (5.21): Means and Sign Test values for "Depression"

	Paragraph	Mean	Proportional mean (%)	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Loss of sexual interest or pleasure	1.68	42.03	1.42	-1.79	0.037*	6
2.	Feeling low in energy or slowed sown	2.01	50.16	1.33	0.00	0.500	2
3.	Thoughts of ending life	1.25	31.21	1.36	-4.86	0.000	13
4.	Crying easily	1.83	45.68	1.23	-1.01	0.156	4
5.	Feeling of being trapped or caught	1.60	40.06	1.31	-2.78	0.003*	8
6.	Blaming yourself for things	1.52	37.89	1.28	-3.77	0.000*	12
7.	Feeling lonely	1.61	40.37	1.37	-2.50	0.006*	7
8.	Feeling blue	1.90	47.53	1.37	-0.81	0.208	3
9.	Worrying too much about things	1.54	38.51	1.26	-3.74	0.000*	10
10.	Feeling no interest in things	1.52	38.04	1.19	-3.82	0.000*	11
11.	Feeling hopeless about the future	1.71	42.70	1.39	-2.15	0.016*	5
12.	Feeling everything is an effort	2.24	55.94	1.31	2.22	0.013*	1
13.	Feeling of worthlessness	1.56	39.06	1.40	-3.39	0.000*	9
	Depression	1.70	42.48	0.86	-3.12	0.001*	

* The mean is significantly different from the hypothesized value 2

5.5.5.: Anxiety:

In general for " Anxiety ", Table (5.22) shows that 27.2% of the respondents choose " not at all ", 19.7% choose " a little bit ", 25.0% choose " Moderately ", 20.8% choose " quite a bit ", and 7.3% choose " Extremely ".

Table (5.22): Frequencies and Percentages for " Anxiety "

Anxiety	Responses	
	N	Percent
not at all	439	27.2%
a little bit	317	19.7%
moderately	404	25.0%
quite a bit	335	20.8%
Extremely	118	7.3%

Table (5.23) shows the following results:

- The mean of item7 “Spells of terror or panic” equals 1.85 (46.30%), Sign Test-value = -0.54, and P-value = 0.296 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "moderately" for this paragraph.
- The mean of item1 “Nervousness or shakiness inside” equals 1.71 (42.75%), Sign Test-value = -2.02, and P-value = 0.022 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of item2 “Trembling” equals 1.40 (34.88%), Sign Test-value = -4.51, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly

smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.

- The mean of "Anxiety" equals 1.62 (40.44%), Sign Test-value = -3.65, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for "Anxiety ".
- The percentage within one standard deviation above the mean for anxiety equals 7.98%.

Table (5.23): Means and Sign Test values for "Anxiety"

	Paragraph	Mean	Proportional mean	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Nervousness or shakiness inside	1.71	42.75	1.23	-2.02	0.022*	4
2.	Trembling	1.40	34.88	1.21	-4.51	0.000*	10
3.	Suddenly scared for no reason	1.46	36.57	1.26	-3.61	0.000*	9
4.	Feeling fearful	1.49	37.26	1.25	-3.86	0.000*	8
5.	Heart pounding or racing	1.60	39.94	1.28	-3.01	0.001*	5
6.	Feeling tense or Keyed up	1.77	44.29	1.29	-1.38	0.084	2
7.	Spells of terror or panic	1.85	46.30	1.26	-0.54	0.296	1
8.	Feeling so restless you couldn't sit still	1.57	39.29	1.23	-2.90	0.002*	6
9.	Feeling that familiar things are strange or unreal	1.77	44.29	1.34	-1.18	0.120	3
10.	Feeling pushed to get things done	1.51	37.65	1.37	-3.61	0.000*	7
	Anxiety	1.62	40.44	0.88	-3.65	0.000*	

* The mean is significantly different from the hypothesized value 2

5.5.6.: Hostility:

In general for "hostility ", Table (5.24) shows that 32.1% of the respondents choose " not at all ", 18.1% choose " a little bit ", 23.4% choose " Moderately ", 18.5% choose " quite a bit ", and 7.9% choose " Extremely ".

Table (5.24): Frequencies and Percentages for the filed " Hostility "

Hostility	Responses	
	N	Percent
not at all	310	32.1%
a little bit	175	18.1%
moderately	226	23.4%
quite a bit	179	18.5%
extremely	76	7.9%

Table (5.25) shows the following results:

- The mean of item2 “Temper outbursts that you could not control” equals 1.84 (46.12%), sign Test-value = -1.28, and P-value = 0.100 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "moderately" for this paragraph.
- The mean of item6 “Shouting or throwing things” equals 1.46 (36.41%), Sign Test-value = -3.53, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of item3 “Having urges to beat, injure or harm someone” equals 1.22 (30.56%), Sign Test-value = -5.28, and P-value = 0.000 which is smaller than

the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.

- The mean of "Hostility" equals 1.52 (38.08%), Sign Test-value = -4.62, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for the field of "Hostility ".
- The percentage within one standard deviation above the mean for hostility equals 7.98%.

Table (5.25): Means and Sign Test values for "Hostility"

	Paragraph	Mean	Proportional mean	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Feeling easily annoyed or irritated	1.82	45.52	1.25	-1.33	0.092	2
2.	Temper outbursts that you could not control	1.84	46.12	1.26	-1.28	0.100	1
3.	Having urges to beat, injure or harm someone	1.22	30.56	1.35	-5.28	0.000*	6
4.	Having urges to break or smash things	1.40	34.94	1.38	-4.19	0.000*	4
5.	Getting into frequent arguments	1.38	34.38	1.21	-4.55	0.000*	5
6.	Shouting or throwing things	1.46	36.41	1.35	-3.53	0.000*	3
7.	Hostility	1.52	38.08	0.93	-4.62	0.000*	

* The mean is significantly different from the hypothesized value 2

5.5.7: Phobic Anxiety:

In general for " Phobic Anxiety ", Table (5.26) shows that 32.1% of the respondents choose " not at all ", 16.4% choose " a little bit ", 23.6% choose " Moderately ", 19.7% choose " quite a bit ", and 8.2% choose " Extremely ".

Table (5.26): Frequencies and Percentages for " Phobic Anxiety "

Phobic Anxiety	Responses	
	N	Percent
not at all	361	32.1%
a little bit	185	16.4%
moderately	265	23.6%
quite a bit	222	19.7%
extremely	92	8.2%

Table (5.27) shows the following results:

- The mean of item4 “Having to avoid certain things, places or activities” equals 1.83 (45.65%), Sign Test-value = -0.74, and P-value = 0.230 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "moderately" for this paragraph.
- The mean of item6 “Feeling nervous when you are left alone” equals 1.60 (40.00%), Sign Test-value = -3.50, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of item2 “Feeling afraid to go out of your house alone” equals 1.41 (35.28%), Sign Test-value = -3.09, and P-value = 0.001 which is smaller than

the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.

- The mean of "Phobic Anxiety" equals 1.56 (39.12%), Sign Test-value = -3.86, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for "Phobic Anxiety ".
- The percentage within one standard deviation above the mean for phobic anxiety equals 6.13%.

Table (5.27): Means and Sign Test values for "Phobic Anxiety"

	Paragraph	Mean	Proportional mean	Standard |Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Feeling afraid in open spaces or on the street	1.47	36.80	1.32	-3.67	0.000*	6
2.	Feeling afraid to go out of your house alone	1.41	35.28	1.36	-3.09	0.001*	7
3.	Feeling afraid to travel on buses , subways or trains	1.48	36.88	1.39	-3.47	0.0008	5
4.	Having to avoid certain things, places or activities	1.83	45.65	1.29	-0.74	0.230	1
5.	Feeling uneasy in crowds such as shopping or at a movie	1.56	39.04	1.35	-2.67	0.004*	3
6.	Feeling nervous when you are left alone	1.60	40.00	1.29	-3.50	0.000*	2
7.	Feeling afraid you will faint in public	1.53	38.35	1.30	-3.09	0.001*	4
	Phobic Anxiety	1.56	39.12	0.94	-3.86	0.000*	

* The mean is significantly different from the hypothesized value 2

5.5.8: Paranoid Ideation:

In general for " Paranoid Ideation ", Table (5.28) shows that % of the respondents choose " not at all ", % choose " a little bit ", % choose " Moderately ", % choose " quite a bit ", and % choose " Extremely ".

Table (5.28): Frequencies and Percentages for "paranoid ideation"

Paranoid Ideation	Responses	
	N	Percent
not at all	331	34.1%
a little bit	167	17.2%
moderately	237	24.4%
quite a bit	182	18.8%
extremely	53	5.5%

Table (5.29) shows the following results:

- The mean of item2 “Feeling that most people cannot be trusted” equals 1.62 (40.43%), Sign Test-value = -2.55, and P-value = 0.005 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of item6 “Feeling that people will take advantage of you if you let them” equals 1.25 (31.33%), Sign Test-value = -5.41, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of “Paranoid Ideation” equals 1.45 (36.15%), Sign Test-value = -3.72, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller

than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for “Paranoid Ideation ".

- The percentage within one standard deviation above the mean for paranoid ideation equals 7.36%.

Table (5.29): Means and Sign Test values for “Paranoid Ideation”

	Paragraph	Mean	Proportional mean (%)	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Feeling others are to blame for most of your troubles	1.42	35.43	1.25	-4.33	0.000*	4
2.	Feeling that most people cannot be trusted	1.62	40.43	1.25	-2.55	0.005*	1
3.	Feeling that you are watched or talked about by others	1.40	35.12	1.39	-3.57	0.000*	5
4.	Having ideas or beliefs that others do not share	1.47	36.80	1.26	-3.89	0.000*	3
5.	Others not giving you proper credit for your achievements	1.49	37.26	1.24	-3.47	0.000*	2
6.	Feeling that people will take advantage of you if you let them	1.25	31.33	1.27	-5.41	0.000*	6
	Paranoid Ideation	1.45	36.15	0.99	-3.72	0.000*	

* The mean is significantly different from the hypothesized value 2

5.5.9.: Psychoticism:

In general for " Psychoticism ", Table (5.30) shows that 37.7% of the respondents choose " not at all ", 16.5% choose " a little bit ", 20.7% choose " Moderately ", 18.1% choose " quite a bit ", and 6.9% choose " Extremely ".

Table (5.30): Frequencies and Percentages for " Psychoticism "

Psychoticism	Responses	
	N	Percent
not at all	603	37.7%
a little bit	263	16.5%
moderately	331	20.7%
quite a bit	290	18.1%
extremely	111	6.9%

Table (5.31) shows the following results:

- The mean of item8 “The idea that something serious is wrong with your body” equals 1.84 (46.07%), Sign Test-value = -0.90, and P-value = 0.184 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "moderately" for this paragraph.
- The mean of item9 “Never feeling close to another PERSONAL” equals 1.49 (37.26%), Sign Test-value = -3.02, and P-value = 0.001 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.

- The mean of item2 “Hearing voices that other people do not hear” equals 1.04 (26.09%), Sign Test-value = -6.21, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of “Psychoticism” equals 1.41 (35.21%), Sign Test-value = -4.22, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for “Psychoticism ".
- The percentage within one standard deviation above the mean for Psychoticism equals 4.29%.

Table (5.31): Means and Sign Test values for "Psychoticism"

	Paragraph	Mean	Proportional mean (%)	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	The idea that someone else can control your thoughts	1.36	33.95	1.34	-4.40	0.000*	6
2.	Hearing voices that other people do not hear	1.04	26.09	1.28	-6.21	0.000*	10
3.	Other people being aware of your private thoughts	1.32	33.07	1.34	-4.68	0.000*	7
4.	Having thoughts that are not your own	1.47	36.80	1.31	-3.59	0.000*	3
5.	Feeling lonely even when you are with people	1.45	36.16	1.29	-4.40	0.000*	5
6.	Having thoughts about sex that bother you a lot	1.45	36.31	1.38	-3.42	0.000*	4
7.	The idea that you should be punished for your sins	1.30	32.55	1.31	-4.40	0.000*	8
8.	The idea that something serious is wrong with your body	1.84	46.07	1.30	-0.90	0.184	1
9.	Never feeling close to another PERSONAL	1.49	37.26	1.33	-3.02	0.001*	2
10.	The idea that something is wrong with your mind	1.29	32.14	1.35	-5.26	0.000*	9
	Psychoticism	1.41	35.21	0.98	-4.22	0.000*	

* The mean is significantly different from the hypothesized value 2

5.5.10.: Additional Items:

In general for " Additional Items ", Table (5.32) shows that % of the respondents choose " not at all ", % choose " a little bit ", % choose " Moderately ", % choose " quite a bit ", and % choose " Extremely ".

Table (5.32): Frequencies and Percentages for " Additional Items "

Additional Items	Responses	
	N	Percent
not at all	288	25.5%
a little bit	256	22.6%
moderately	258	22.8%
quite a bit	237	21.0%
extremely	92	8.1%

Table (5.33) shows the following results:

- The mean of item2 “Trouble falling asleep” equals 1.82 (45.52%), Sign Test-value = -0.82, and P-value = 0.206 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 2. We conclude that the respondents opinion is not significantly different from "moderately" for this paragraph.
- The mean of item4 “Overeating” equals 1.59 (39.75%), Sign Test-value = -2.74, and P-value = 0.003 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.
- The mean of item7 “Feeling of guilt” equals 1.31 (32.66%), Sign Test-value = -5.04, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this

paragraph is significantly smaller than the hypothesized value 2 . We conclude that the respondents opinion is " a little bit " for this paragraph.

- The mean of "Additional Items" equals 1.64 (41.00%), Sign Test-value = -3.21, and P-value=0.001 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for "Additional Items ".
- The percentage within one standard deviation above the mean for additional items equals 9.20%.

Table (5.33): Means and Sign Test values for "Additional Items"

	Paragraph	Mean	Proportional mean (%)	Standard Deviation	Sign Test value	P-value (Sig.)	Rank
1.	Poor appetite	1.59	39.66	1.15	-3.92	0.000*	5
2.	Trouble falling asleep	1.82	45.52	1.25	-0.82	0.206	2
3.	Thoughts of death or dying	1.51	37.81	1.38	-3.27	0.001*	6
4.	Overeating	1.59	39.75	1.33	-2.74	0.0038	4
5.	Awakening in the early morning	1.89	47.24	1.24	-1.24	0.107	1
6.	Sleep that is restless or smash things	1.75	43.63	1.29	-1.60	0.055	3
7.	Feeling of guilt	1.31	32.66	1.27	-5.04	0.000*	7
	Additional Items	1.64	41.00	0.83	-3.21	0.001*	

* The mean is significantly different from the hypothesized value 2

In general for the " Mental Health", Table (5.34) shows that 28.8% of the respondents choose " not at all ", 19.5% choose " a little bit ", 23.5% choose " Moderately ", 19.6% choose " quite a bit ", and 8.4% choose " Extremely ".

Table (5.34): Frequencies and Percentages for " Mental Health "

Mental Health	Responses	
	N	Percent
not at all	4,182	28.8%
a little bit	2,831	19.5%
moderately	3,413	23.5%
quite a bit	2,847	19.6%
extremely	1,224	8.4%

Table (5.35) shows the following results:

- The mean of the "Mental Health" equals 1.60 (39.98%), Sign Test-value = -4.70, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this field is significantly smaller than the hypothesized value 2. We conclude that the respondents opinion is " a little bit " for "Mental Health ".
- The percentage within one standard deviation above the mean for mental health equals 6.75%.

Table (5.35): Means and Sign Test values for "All paragraphs of the questionnaire for " Mental Health".

Item	Mean	Proportional mean	Standard Deviation	Sign Test value	P-value (Sig.)
Mental Health Questionnaire (SCL -90- R)	1.60	39.98	0.81	-4.70	0.000*

* The mean is significantly different from the hypothesized value 2

5.6.: Research hypothesis:

5.6.1.: hypothesis 1:

There is no relationship between risk factors and physical dysfunctions of hemiplegia in Gaza strip.

5.6.1.1.: Gender and physical dysfunctions:

Table (5.36) shows the Pearson Chi-Square statistic, which is equal to 10.468 with a significance (p-value) equals to 0.005, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that GENDER and " physical functioning domain?" are not independent of each other. In other words, these two variables are significantly related

Table (5.36): Gender and PFD Chi Square statistics

			GENDER		Total	Chi Square	P-value
			Male	Female			
physical functioning domain	No, not limited at all	N	183	96	279	10.468	0.005*
		%	65.6%	34.4%	100.0%		
	Yes, limited a little	N	363	242	605		
		%	60.0%	40.0%	100.0%		
	Yes, limited a lot	N	400	330	730		
		%	54.8%	45.2%	100.0%		

* The relationship is statistically significant at 0.05 level

Table (5.37) shows the Pearson Chi-Square statistic, which is equal to 2.574with a significance (p-value) equals to 0.109, which is greater than $\alpha = 0.05$. Thus, there exists sufficient evidence to do not reject the null hypothesis of no association. We conclude that GENDER and role limitation due to physical health domain are independent of each other.

Table (5.37): Gender and role limitation due to physical health domain Chi Square statistics

			GENDER		Total	Chi Square	P-value
			Male	Female			
role limitation due to physical health domain	YES	N	95	52	147	2.574	0.109
		%	64.6%	35.4%	100.0%		
	NO	N	289	216	505		
		%	57.2%	42.8%	100.0%		

5.6.1.2.: Age and physical dysfunctions:

Table (5.38) shows the Pearson Chi-Square statistic, which is equal to 63.042 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that AGE and physical functioning domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.38): Age and PFD Chi Square statistics

			AGE				Total	Chi Square	P-value
			5 - less than 20	20 - less than 30	30 - less than 40	40 and older			
Physical functioning domain	No, not limited at all	N	27	76	48	128	279	63.042	0.000*
		%	9.7%	27.2%	17.2%	45.9%	100.0%		
	Yes, limited a little	N	85	179	91	250	605		
		%	14.0%	29.6%	15.0%	41.3%	100.0%		
	Yes, limited a lot	N	77	136	69	448	730		
		%	10.5%	18.6%	9.5%	61.4%	100.0%		

* The relationship is statistically significant at 0.05 level

Table (5.39) shows the Pearson Chi-Square statistic, which is equal to 8.534 with a significance (p-value) equals to 0.036, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that AGE and role limitation due to physical health domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.39): Age and role limitation due to physical health domain Chi Square statistics

			AGE				Total	Chi Square	P-value
			5 - less than 20	20 - less than 30	30 - less than 40	40 and older			
Role limitation due to physical health domain	YES	N	18	48	20	61	147	8.534	0.036*
		%	12.2%	32.7%	13.6%	41.5%	100.0 %		
	NO	N	58	112	64	271	505		
		%	11.5%	22.2%	12.7%	53.7%	100.0 %		

* The relationship is statistically significant at 0.05 level

5.6.1.3.: Smoking and physical dysfunctions:

Table (5.40) shows the Pearson Chi-Square statistic, which is equal to 194.606 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Smoking and physical functioning domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.40): Smoking and PFD Chi Square statistics

			Were you smoking before having stroke?		Total	Chi Square	P-value
			YES	NO			
Physical functioning domain	No, not limited at all	N	137	142	279	11.331	0.003*
		%	49.1%	50.9%	100.0%		
	Yes, limited a little	N	234	371	605		
		%	38.7%	61.3%	100.0%		
	Yes, limited a lot	N	277	453	730		
		%	37.9%	62.1%	100.0%		

* The relationship is statistically significant at 0.05 level

Table (5.41) shows the Pearson Chi-Square statistic, which is equal to .224 with a significance (p-value) equals to 0.636, which is greater than $\alpha = 0.05$. Thus, there exists sufficient evidence to do not reject the null hypothesis of no association. We conclude that Smoking and role limitation due to physical health domain are independent of each other.

Table (5.41): Smoking and role limitation due to physical health domain Chi Square statistics

			Were you smoking before having stroke?		Total	Chi Square	P-value
			YES	NO			
role limitation due to physical health domain	YES	N	62	85	147	.224	0.636
		%	42.2%	57.8%	100.0%		
	NO	N	202	303	505		
		%	40.0%	60.0%	100.0%		

5.6.1.4.: Hypertension and physical dysfunctions:

Table (5.42) shows the Pearson Chi-Square statistic, which is equal to 55.319 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Hypertension and physical functioning domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.42): Hypertension and PFD Chi Square statistics

			hypertension		Total	Chi Square	P-value
			YES	NO			
Physical functioning domain	No, not limited at all	N	88	191	279	55.319	0.000*
		%	31.5%	68.5%	100.0%		
	Yes, limited a little	N	140	465	605		
		%	23.1%	76.9%	100.0%		
	Yes, limited a lot	N	309	421	730		
		%	42.3%	57.7%	100.0%		

* The relationship is statistically significant at 0.05 level

Table (5.43) shows the Pearson Chi-Square statistic, which is equal to 4.538 with a significance (p-value) equals to 0.033, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Hypertension and role limitation due physical health domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.43): Hypertension and role limitation due to physical health domain Chi Square statistics

			hypertension		Total	Chi Square	P-value
			YES	NO			
Role limitation due to physical health domain	YES	N	38	109	147	4.538	0.033*
		%	25.9%	74.1%	100.0%		
	NO	N	178	327	505		
		%	35.2%	64.8%	100.0%		

* The relationship is statistically significant at 0.05 level

5.6.1.5.: Diabetes Mellitus and physical dysfunctions:

Table (5.44) shows the Pearson Chi-Square statistic, which is equal to 9.906 with a significance (p-value) equals to 0.007, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Diabetes mellitus and physical functioning domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.44): DM and PFD Chi Square statistics

			Do you have diabetes mellitus?		Total	Chi Square	P-value
			YES	NO			
Physical functioning domain	No, not limited at all	N	46	233	279	9.906	0.007*
		%	16.5%	83.5%	100.0%		
	Yes, limited a little	N	99	506	605		
		%	16.4%	83.6%	100.0%		
	Yes, limited a lot	N	165	565	730		
		%	22.6%	77.4%	100.0%		

* The relationship is statistically significant at 0.05 level

Table (5.45) shows the Pearson Chi-Square statistic, which is equal to .499 with a significance (p-value) equals to 0.480, which is greater than $\alpha = 0.05$. Thus, there exists sufficient evidence to do not reject the null hypothesis of no association. We conclude that Diabetes mellitus and role limitation due to physical health domain are independent of each other.

Table (5.45): DM and role limitation due to physical health domain Chi Square statistics

			Do you have diabetes mellitus?		Total	Chi Square	P-value
			YES	NO			
Role limitation due to physical health domain	YES	N	25	122	147	.499	0.480
		%	17.0%	83.0%	100.0%		
	NO	N	99	406	505		
		%	19.6%	80.4%	100.0%		

5.6.1.6.: Hyperlipidemia and physical dysfunctions:

Table (5.46) shows the Pearson Chi-Square statistic, which is equal to 11.006 with a significance (p-value) equals to 0.004, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Hyperlipidemia and physical functioning domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.46): Hyperlipidemia and PFD Chi Square statistics

			Were you suffering from Hyperlipidemia?		Total	Chi Square	P-value
			YES	NO			
Physical functioning domain	No, not limited at all	N	26	253	279	11.006	0.004*
		%	9.3%	90.7%	100.0%		
	Yes, limited a little	N	90	515	605		
		%	14.9%	85.1%	100.0%		
	Yes, limited a lot	N	129	601	730		
		%	17.7%	82.3%	100.0%		

* The relationship is statistically significant at 0.05 level

Table (5.47) shows the Pearson Chi-Square statistic, which is equal to .014 with a significance (p-value) equals to 0.906 , which is greater than $\alpha = 0.05$. Thus, there exists sufficient evidence to do not reject the null hypothesis of no association. We conclude that Hyperlipidemia and role limitation due to physical health domain are independent of each other.

Table (5.47): Hyperlipidemia and role limitation due to physical health domain Chi Square statistics

			Were you suffering from Hyperlipidemia?		Total	Chi Square	P-value
			YES	NO			
Role limitation due to physical health domain	YES	N	23	124	147	.014	0.906
		%	15.6%	84.4%	100.0%		
	NO	N	77	428	505		
		%	15.2%	84.8%	100.0%		

5.6.1.7: Psychological stresses and physical dysfunctions:

Table (5.48) shows the Pearson Chi-Square statistic, which is equal to 15.731 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Psychological stresses and physical functioning domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.48): Psychological stresses and PFD Chi Square statistics

			Were you suffering from psychological stresses before having stroke?		Total	Chi Square	P-value
			YES	NO			
Physical functioning domain	No, not limited at all	N	134	145	279	15.731	0.000*
		%	48.0%	52.0%	100.0%		
	Yes, limited a little	N	357	248	605		
		%	59.0%	41.0%	100.0%		
	Yes, limited a lot	N	359	371	730		
		%	49.2%	50.8%	100.0%		

* The relationship is statistically significant at 0.05 level

Table (5.49) shows the Pearson Chi-Square statistic, which is equal to .007 with a significance (p-value) equals to 0.934 , which is greater than $\alpha = 0.05$. Thus, there exists sufficient evidence to do not reject the null hypothesis of no association. We conclude that Psychological stresses and role limitation due to physical health domain are independent of each other.

Table (5.49): Psychological stresses and role limitation due to physical health domain Chi Square statistics

			Were you suffering from psychological stresses before having stroke?		Total	Chi Square	P-value
			YES	NO			
Role limitation due to physical health domain	YES	N	78	69	147	.007	0.934
		%	53.1%	46.9%	100.0%		
	NO	N	266	239	505		
		%	52.7%	47.3%	100.0%		

5.6.2.: hypothesis 2:

There is no relationship between risk factors and psychological dysfunctions of hemiplegia in Gaza strip.

5.6.2.1: Gender and psychological dysfunctions:

Table (5.50) shows the Pearson Chi-Square statistic, which is equal to 31.646 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Mental health and Gender are not independent of each other. In other words, these two variables are significantly related.

Table (5.50): Gender and psychological dysfunctions Chi Square statistics

Gender		Mental health					Total	Chi Square	P-value
		not at all	a little bit	moderately	quite a bit	extremely			
Male	N	2,598	1,684	1,954	1,596	720	8,552	31.646	0.000*
	%	30.4%	19.7%	22.8%	18.7%	8.4%	100.0%		
Female	N	1,584	1,147	1,459	1,251	504	5,945		
	%	26.6%	19.3%	24.5%	21.0%	8.5%	100.0%		

* The relationship is statistically significant at 0.05 level

5.6.2.2.: Age and psychological dysfunctions:

Table (5.51) shows the Pearson Chi-Square statistic, which is equal to 883.054 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Mental health and Age are not independent of each other. In other words, these two variables are significantly related.

Table (5.51): Age and psychological dysfunctions Chi Square statistics

Age		Mental health					Total	Chi Square	P-value
		not at all	a little bit	moderately	quite a bit	extremely			
5 - less than 20	N	269	374	511	456	70	1,680	883.054	0.000*
	%	16.0%	22.3%	30.4%	27.1%	4.2%	100.0%		
20 - less than 30	N	676	720	1,124	870	157	3,547		
	%	19.1%	20.3%	31.7%	24.5%	4.4%	100.0%		
30 - less than 40	N	571	368	377	362	199	1,877		
	%	30.4%	19.6%	20.1%	19.3%	10.6%	100.0%		
40 and older	N	2,666	1,369	1,401	1,159	798	7,393		
	%	36.1%	18.5%	19.0%	15.7%	10.8%	100.0%		

* The relationship is statistically significant at 0.05 level

5.6.2.3.: smoking and psychological dysfunctions:

Table (5.52) shows the Pearson Chi-Square statistic, which is equal to 40.321 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Mental health and smoking are not independent of each other. In other words, these two variables are significantly related.

Table (5.52): smoking and psychological dysfunctions Chi Square statistics

			Mental health					Total	Chi Square	P-value
			not at all	a little bit	moderately	quite a bit	extremely			
Were you smoking before having stroke?	Yes	N	1,683	1,069	1,387	1,162	592	5,893	40.321	0.000*
		%	28.6%	18.1%	23.5%	19.7%	10.0%	100.0%		
	No	N	2,499	1,762	2,026	1,685	632	8,604		
		%	29.0%	20.5%	23.5%	19.6%	7.3%	100.0%		

* The relationship is statistically significant at 0.05 level

5.6.2.4.: Hypertension and psychological dysfunctions:

Table (5.53) shows the Pearson Chi-Square statistic, which is equal to 888.470 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Mental health and hypertension are not independent of each other. In other words, these two variables are significantly related.

Table (5.53): Hypertension and psychological dysfunctions Chi Square statistics

			Mental health					Total	Chi Square	P-value
			not at all	a little bit	moderately	quite a bit	extremely			
Do you have hypertension?	Yes	N	2,065	961	769	579	453	4,827	888.470	0.000*
		%	42.8%	19.9%	15.9%	12.0%	9.4%	100.0%		
	No	N	2,117	1,870	2,644	2,268	771	9,670		
		%	21.9%	19.3%	27.3%	23.5%	8.0%	100.0%		

* The relationship is statistically significant at 0.05 level

5.6.2.5.: Diabetes Mellitus and psychological dysfunctions:

Table (5.54) shows the Pearson Chi-Square statistic, which is equal to 318.254 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Mental health and diabetes mellitus are not independent of each other. In other words, these two variables are significantly related.

Table (5.54): Diabetes Mellitus and psychological dysfunctions Chi Square statistics

			Mental health					Total	Chi Square	P-value
			not at all	a little bit	moderately	quite a bit	extremely			
Do you have diabetes mellitus?	Yes	N	1,117	615	486	352	186	2,756	318.254	0.000*
		%	40.5%	22.3%	17.6%	12.8%	6.7%	100.0%		
	No	N	3,065	2,216	2,927	2,495	1,038	11,741		
		%	26.1%	18.9%	24.9%	21.3%	8.8%	100.0%		

* The relationship is statistically significant at 0.05 level

5.6.2.6.: Hyperlipidemia and psychological dysfunctions:

Table (5.55) shows the Pearson Chi-Square statistic, which is equal to 37.657 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Mental health and Hyperlipidemia are not independent of each other. In other words, these two variables are significantly related.

Table (5.55): Hyperlipidemia and psychological dysfunctions Chi Square statistics

			Mental health					Total	Chi Square	P-value
			not at all	a little bit	moderately	quite a bit	extremely			
Were you suffering from Hyperlipidemia?	Yes	N	582	460	597	447	136	2,222	37.657	0.000*
		%	26.2%	20.7%	26.9%	20.1%	6.1%	100.0%		
	No	N	3,600	2,371	2,816	2,400	1,088	12,275		
		%	29.3%	19.3%	22.9%	19.6%	8.9%	100.0%		

* The relationship is statistically significant at 0.05 level

5.7.2.7.: Psychological stresses and psychological dysfunctions:

Table (5.56) shows the Pearson Chi-Square statistic, which is equal to 2283.316 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Mental health and psychological stresses are not independent of each other. In other words, these two variables are significantly related.

Table (5.56): Psychological stresses and psychological dysfunctions Chi Square statistics

			Mental health					Total	Chi Square	P-value
			not at all	a little bit	moderately	quite a bit	extremely			
Were you suffering from psychological stresses before having stroke?	Yes	N	1,078	1,260	2,276	2,155	837	7,606	2283.316	0.000*
		%	14.2%	16.6%	29.9%	28.3%	11.0%	100.0%		
	No	N	3,104	1,571	1,137	692	387	6,891		
		%	45.0%	22.8%	16.5%	10.0%	5.6%	100.0%		

* The relationship is statistically significant at 0.05 level

5.6.3.: hypothesis 3:

There is no relationship between rehabilitation and reduction of physical dysfunctions of hemiplegia in Gaza strip.

5.6.3.1.: rehabilitation commencement and physical functioning domain:

Table (5.57) shows the Pearson Chi-Square statistic, which is equal to 61.109 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that physical functioning domain and rehabilitation commencement are not independent of each other. In other words, these two variables are significantly related.

Table (5.57): rehabilitation commencement and physical functioning domain Chi Square statistics

			Physical functioning domain			Total	Chi Square	P-value
			No, not limited at all	Yes, limited a little	Yes, limited a lot			
rehabilitation commencement	Directly after having stroke	N	161	362	357	880	61.109	0.000*
		%	18.3%	41.1%	40.6%	100.0%		
	From 1 month to 3 months after having stroke	N	41	138	146	325		
		%	12.6%	42.5%	44.9%	100.0%		
	From 3 month to 6 months after having stroke	N	5	14	41	60		
		%	8.3%	23.3%	68.3%	100.0%		
	From 6 month to 1 year after having stroke	N	52	45	73	170		
		%	30.6%	26.5%	42.9%	100.0%		
	More than 1 year after having stroke	N	20	41	88	149		
		%	13.4%	27.5%	59.1%	100.0%		

* The relationship is statistically significant at 0.05 level

5.6.3.2.: rehabilitation commencement and role limitation due to physical health domain:

Table (5.58) shows the Pearson Chi-Square statistic, which is equal to 5.711 with a significance (p-value) equals to 0.222 , which is greater than $\alpha = 0.05$. Thus, there exists sufficient evidence to do not reject the null hypothesis of no association. We conclude that role limitation due to physical health domain and rehabilitation commencement are independent of each other.

Table (5.58): rehabilitation commencement and role limitation due to physical health domain Chi Square statistics

			Role limitation due to physical health		Total	Chi Square	P-value
			Yes	No			
rehabilitation commencement	Directly after having stroke	N	94	262	356	5.711	0.222
		%	26.4%	73.6%	100.0%		
	From 1 month to 3 months after having stroke	N	24	108	132		
		%	18.2%	81.8%	100.0%		
	From 3 month to 6 months after having stroke	N	5	19	24		
		%	20.8%	79.2%	100.0%		
	From 6 month to 1 year after having stroke	N	14	54	68		
		%	20.6%	79.4%	100.0%		
	More than 1 year after having stroke	N	10	50	60		
		%	16.7%	83.3%	100.0%		

5.6.3.4.: rehabilitation intensity and physical functioning domain:

Table (5.59) shows the Pearson Chi-Square statistic, which is equal to 15.790 with a significance (p-value) equals to 0.003, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that rehabilitation intensity and physical functioning domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.59): rehabilitation intensity and physical functioning domain Chi Square statistics

			Rehabilitation intensity			Total	Chi Square	P-value
			Less than 30 days	30 - Less than 60 days	60 days and above			
Physical functioning	No, not limited at all	N	53	181	45	279	15.790	0.003*
		%	19.0%	64.9%	16.1%	100.0 %		
	Yes, limited a little	N	98	420	82	600		
		%	16.3%	70.0%	13.7%	100.0 %		
	Yes, limited a lot	N	164	470	71	705		
		%	23.3%	66.7%	10.1%	100.0 %		

* The relationship is statistically significant at 0.05 level

5.6.3.5.: rehabilitation intensity and role limitation due to physical health domain:

Table (5.60) shows the Pearson Chi-Square statistic, which is equal to 7.757 with a significance (p-value) equals to 0.021, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that rehabilitation intensity and role limitation due to physical health domain are not independent of each other. In other words, these two variables are significantly related.

Table (5.60): rehabilitation intensity and role limitation due to physical health domain Chi Square statistics

			Rehabilitation intensity			Total	Chi Square	P-value
			Less than 30 days	30 - Less than 60 days	60 days and above			
Role limitation due to physical health	Yes	N	25	94	28	147	7.757	0.021*
		%	17.0%	63.9%	19.0%	100.0 %		
	No	N	103	338	52	493		
		%	20.9%	68.6%	10.5%	100.0 %		

* The relationship is statistically significant at 0.05 level

5.6.4.: hypothesis 4:

There is no relationship between rehabilitation and reduction of psychological dysfunctions of hemiplegic in Gaza strip.

5.6.4.1.: rehabilitation commencement and mental health:

Table (5.61) shows the Pearson Chi-Square statistic, which is equal to 518.097 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Mental Health And rehabilitation commencement are not independent of each other. In other words, these two variables are significantly related.

Table (5.61): rehabilitation commencement and mental health Chi Square statistics

Mental Health		rehabilitation commencement					Total	Chi Square	P-value
		Directly after having stroke	From 1 month to 3 months after	From 3 month to 6 months after	From 6 month to 1 year after	More than 1 year after			
not at all	N	2,399	854	135	477	268	4,133	518.097	0.000*
	%	58.0%	20.7%	3.3%	11.5%	6.5%	100.0%		
a little bit	N	1,686	515	129	228	224	2,782		
	%	60.6%	18.5%	4.6%	8.2%	8.1%	100.0%		
moderately	N	1,979	682	148	298	267	3,374		
	%	58.7%	20.2%	4.4%	8.8%	7.9%	100.0%		
quite a bit	N	1,507	583	97	300	314	2,801		
	%	53.8%	20.8%	3.5%	10.7%	11.2%	100.0%		
extremely	N	358	309	24	203	244	1,138		
	%	31.5%	27.2%	2.1%	17.8%	21.4%	100.0%		

* The relationship is statistically significant at 0.05 level

5.6.4.2.: rehabilitation intensity and mental health:

Table (5.62) shows the Pearson Chi-Square statistic, which is equal to 243.361 with a significance (p-value) equals to 0.000, which is less than $\alpha = 0.05$. Thus, there exists sufficient evidence to reject the null hypothesis of no association. We conclude that Mental Health And rehabilitation intensity are not independent of each other. In other words, these two variables are significantly related.

Table (5.62): rehabilitation intensity and mental health Chi Square statistics

Mental Health		Rehabilitation intensity			Total	Chi Square	P-value
		Less than 30 days	30 - less than 60 days	60 days and above			
not at all	N	975	2,732	426	4,133	243.361	0.000*
	%	23.6%	66.1%	10.3%	100.0 %		
a little bit	N	545	1,881	356	2,782		
	%	19.6%	67.6%	12.8%	100.0 %		
moderately	N	491	2,338	545	3,374		
	%	14.6%	69.3%	16.2%	100.0 %		
quite a bit	N	484	1,928	389	2,801		
	%	17.3%	68.8%	13.9%	100.0 %		
extremely	N	345	719	74	1,138		
	%	30.3%	63.2%	6.5%	100.0 %		

* The relationship is statistically significant at 0.05 level

CAHPER SIX

DISCUSSION

On this chapter, the researcher will discuss the research results which was achieved through application of demographic form, mental health questionnaire (SCL- 90 – R) and SF36 questionnaire. This section will be discussed in 4 main areas (demographic form, hemiplegia risk factors, hemiplegia dysfunctions and research hypothesis). First of all, the main study results will be displayed. Then, the researcher will discuss these results on the light of the literature which was presented in the previous chapters.

6.1. Discussion of the demographic data results :

The results of the gender ratio among the hemiplegics in this study showed that 58.9% of the study sample was males while 41.1% of the study sample was females. These results came in line with the screening and registration of the disabled in Gaza city done by Movimiento La Paz (2003) who showed that the ratio of people having stroke was 56% males and 44% are females. Also these results was supported by the results of the disabled persons in the Palestinian territory which assured that the ratio of disabled males are higher than the ratio of disabled females (Palestinian Central Bureau Statistics, 2000).

The results of the chronological age among the hemiplegics in this study showed that the ratio of hemiplegics in the age group from 5 to less than 20 years, was (11.7%); the ratio of the age group from 20 to less than 30 years, was (24.5%), the ratio of the age group from 30 to less than 40 years, was (12.9%), and the ratio of the age group above 40 years old, was (50.9%). These results show a very high percentage among the young age groups and this can be explained probably due to unidentified risk of infantile hemiplegia after birth and/or the psychological reaction of these age groups to the last war (2009) on Gaza Strip, continuing siege and bad economical and environmental situation in Gaza strip in last year's, this is also supported by the current findings of this study that the highest risk among the study sample was the psychological stresses.

The results of the marital status showed that 27.6% of the study sample was single, 57.7% of the study sample was married, 2.5% of the study sample was divorced, and 12.3% of the study sample was widow which it seems to be a high percentage compared to approximately one third of the study sample are not married, and this can be explained due to the last war (2009) on Gaza Strip in where there were around 1600 martyr and approximately 5000 people injured .

The results of educational level for the study sample showed that the ratio of hemiplegics who are illiterate is (22.7%); the ratio of hemiplegics who have elementary education is (23.9%); the ratio of hemiplegics who have secondary education is (32.5%); and the ratio of hemiplegics who have colleague education is (20.9%). These results of illiterate hemiplegics in this study is consistent with the results of Palestinian Central Bureau of statistics,2011, which showed that 56.3% of the total disabled in Gaza Strip are illiterate. The researcher attributes this high

percentage of the illiterate hemiplegics in Gaza strip probably to two reasons, the first reason may be due to the disability stigma which can prevent the patient from studying or continuing education and the second reason probably to the severe outcomes of the disability whether physical, psychological or social outcomes which can affect education in all aspects.

6.2. Discussion of the risk factors results :

There are so many risk factors are counted for hemiplegia , some of them are counted as non modifiable risk factors and some are counted as modifiable risk factors (which can be treated or controlled), the researcher in this study studied two modifiable risk factors (gender and age) and five non modifiable risk factors (hypertension, diabetes mellitus, smoking, Hyperlipidemia and psychological stresses).

The results of the study showed that males are exposed to hemiplegia more than females with average frequency ratio 58.9% and the age group above 40 years old are more exposed to hemiplegia than younger ages with average frequency ratio 50.9%. Among the non modifiable risk factors, psychological stresses was found to be the highest frequency risk factor the participants exposed to with average ratio 52.8% , followed by smoking with average ratio 39.9% , hypertension with average ratio 33.1% , diabetes mellitus with average ratio 19% and Hyperlipidemia are the least frequency risk factor the participants exposed to with average ratio 15.3%. These results support earlier study by Kimberly et al (2007) who reported that among the participants the risk of developing stroke/TIA was 4.21 times greater in those with symptoms of depression, Jood et al (2009) who found an independent association between self perceived psychological stress and ischemic stroke, J Woo (1991) who reported that the attributable risk for hypertension was estimated to be 24% in patients aged greater than or equal to 60 years, Shaper (1991) who reported that systolic blood pressure and cigarette smoking are the major risk factors for stroke in middle aged British men, Jaakko (1996) who reported that diabetes mellitus was the strongest risk factors for death and smoking, systolic blood pressure appeared to be independent risk factors among both sexes, as did serum total cholesterol among men and Eman Taher (2010) who reported that hypertension was the main co morbid condition among Egyptian stroke patients with ratio of 65%.

6.3. Discussion of the hemiplegia dysfunctions results :

6.3.1. Hemiplegia psychological dysfunctions:

The research main general results showed low level of total psychological symptoms (6.75%) compared to the situation that hemiplegics in Gaza Strip live after war and Siege which means high level of mental health satisfaction among hemiplegic patients, also the researcher attributes this low level of psycho-pathological symptoms and high level of mental health satisfaction either in the total psycho-pathological symptoms or in each dimension a side among hemiplegics, to the availability of the comprehensive rehabilitation services that are provided at national center for community rehabilitation and UNRWA physiotherapy centers .

the results also showed that the ten dimensions of (SCL-90-R) were ranked prospectively from the most to the least psychological symptoms as follow : depression, obsessive compulsive, Somatization, additional items, anxiety, hostility, paranoiac ideation, interpersonal sensitivity, phobic anxiety, Psychoticism.

The research results for each dimension of (SCL-90-R) are as follow:

Depression (42.48%) and only 12.88% passed the standard deviation above the mean which is ranked as the first psychological symptom among the participants and these results support the result of earlier study done by Robinson (1997) who reported that the prevalence of post stroke depression varies from 20% to 65%, also it support the result of earlier studies done which all confirm the occurrence of depression symptoms but the frequency vary from one study to the another which can be attributed probably because these studies done in different cultures like Angelelli (2004) who reported depression in 61% poststroke population, Berge (2003) who found that 54% of stroke patients after assessment at 12 0r 18 months felt mildly depressive, Kauhanen (1999) who diagnosed depression 53% among stroke patients and Singh et al (2006) who found depression in 24% of hemiplegic patients.

Obsessive compulsive (44.18%) and only 11.04% passed the standard deviation above the mean which is ranked as the second psychological symptom among the participants and these results support the result of earlier study done by Beckson and Cummings (1991) who reported that obsessive compulsive disorder been described in stroke patients but less common than depression.

Somatization (40.73%) and only 10.43% passed the standard deviation above the mean which is ranked as the third psychological symptom among the participants, and these results came in line with Magni and Schifano (1984) who also used SCL 90 scale and reported 40% of Somatization as a psychological reaction to stroke.

Additional items (41%) and only 9.20% passed the standard deviation above the mean which is ranked as the fourth psychological symptom among the participants, and the researcher attributes this ranking for additional items because these symptoms (eating, sleep and thoughts of death) are related to the bad living situation in Gaza Strip especially after war.

Anxiety (40.44%) and only 7.98% passed the standard deviation above the mean which is ranked as the fifth psychological symptom among the participants, and these results support the result of earlier studies done by Langhorne (2003) who reported anxiety in 16% of stroke patients, Martin (2000) who reported anxiety in 22% of stroke patients, Angelelli (2004) who reported anxiety in 23% of stroke patients, Singh (2006) who reported anxiety in 26% of hemiplegic patients. The researcher attributes the higher rate of the current study compared to the previous studies because of last war 2009 on Gaza strip and the continuing siege.

Little has been mentioned in the literature on Interpersonal sensitivity, phobic anxiety, hostility, paranoid ideation and Psychoticism.

hostility (38.08%) and only 7.98% passed the standard deviation above the mean which is ranked as the sixth psychological symptom among the participants, paranoid Ideation (36.15%) and only 7.36% passed the standard deviation above the mean which is ranked as the seventh psychological symptom among the participants, Interpersonal Sensitivity (39.20%) and only 6.75% passed the standard deviation above the mean which is ranked as the eighth psychological symptom among the participants, Phobic Anxiety (39.12%) and only 6.13% passed the standard deviation above the mean which is ranked as the ninth psychological symptom among the participants, Psychoticism (35.21%) and only 4.29% passed the standard deviation above the mean which is ranked as the tenth psychological symptom among the participants, and these results supported earlier study results by Magni and Schifano (1984) who reported Interpersonal Sensitivity in 3%, Phobic Anxiety in 27%, hostility in 13.4%, paranoid ideation in 7% and Psychoticism in 3% of the stroke group.

6.3.2. Hemiplegia physical dysfunctions:

The research main general results showed that 75.96% has mild to moderate physical disabilities in the physical functioning domain and 22.5% has role limitation due to physical health domain . these results show that 77.5% has no role limitation due to physical health which means that most of the participants has good satisfaction in their activities of daily living. The researcher attributes this high level of satisfaction in the activities of daily living even in the presence of high level physical disabilities to the comprehensive rehabilitation program (especially occupational therapy) that hemiplegics went under it in the national center for community rehabilitation. These results support earlier results by Legg (2006) who reported that occupational therapy focused on improving personal activities of daily living after stroke can improve performance and reduce the risk of deterioration in these disabilities. Also these results are contrary to the study done by Hopman and Verner (2003) who reported that during rehabilitation there were improvement in all domains of SF36 but after discharge only role physical functioning domain continued improvement. The researcher attributes this continuity of improvement to only role physical functioning to the different rehabilitation approaches used mainly occupational therapy.

6.4. Discussion of research hypothesis results :

6.4.1. Hypothesis - 1

There is no relationship between risk factors and physical dysfunctions of hemiplegia in Gaza Strip

6.4.1.1. Risk factors and physical functioning domain:

The research results show that hemiplegia risk factors (age, hypertension, psychological stresses, smoking, Hyperlipidemia, gender and diabetes mellitus) has a significant correlation on physical functioning domain respectively. These results support earlier result by Movimiento La Paz (2003) who did a screening among stroke survivors in Gaza Strip and found that stroke related disabilities are strongly age dependent, although not generally dependent upon sex. These results also support earlier study by Donmez et al (2007) who concluded that age is an important factor that affect the recovery of the upper extremity in hemiplegic patients. The researcher attributes the correlation of hypertension with physical functioning domain to the hypertension duration which ranges among hypertensive patients among the participants from 3 years minimum to 9 years maximum and the correlation between smoking and physical functioning domain to the smoking intensity since 92.3% from the smokers among the participants are moderate to severe smokers.

6.4.1.2. Risk factors and role limitation due physical health domain:

The research results show that hemiplegia risk factors (psychological stresses, smoking, Hyperlipidemia, gender and diabetes mellitus) has no significant correlation on role limitation due to physical health.

The research results also show that hemiplegia risk factors (hypertension and age) has strong correlation on role limitation due to physical health. These results came in line with earlier study by Karatepe et al (2008) who reported that the most frequent comorbid condition on the patients functional outcome was hypertension at the initial visit.

6.4.2. Hypothesis – 2

There is no relationship between risk factors and psychological dysfunctions of hemiplegia in Gaza Strip**.**

Many previous studies studied the association between risk factors and hemiplegia itself but little has been mentioned about the relationship between risk factors and psychological dysfunctions of hemiplegia.

The current findings in this research show that hemiplegia risk factors (psychological stresses, hypertension, age, diabetes mellitus, smoking, Hyperlipidemia and gender) has strong correlation with psychological dysfunctions respectively. The modifiable risk factors results support earlier study by Hamer et al (2010) who reported in a comparison with normotensive participants, an elevated risk of distress was observed in aware hypertensive but not in unaware hypertensives, antihypertensive medication and comorbidity were also associated with psychological distress. Also these results support earlier study by Paile-Hyvärinen et al (2007) who reported that diabetes has a minor independent effect on concurrent occurrence of depressive symptoms. Also these results support earlier study by Boden et al (2010) who concluded that there is a cause and effect relationship between smoking and depression in which cigarette smoking increases the risk of symptoms of depression.

The non modifiable risk factor gender results support earlier study by Andersen et al (1995) who reported that the history of previous depression and female gender factors correlated significantly with post stroke depression. Also these results support the earlier result by Tang et al (2005) who reported that poststroke depression was associated with female gender and lower level of education.

The result of the non modifiable risk factor age was not supported by earlier results and the researcher attributes the relationship between age and stroke psychological dysfunctions probably to different age groups that included in this research which shows that 49.1% are below 40 years old which means that this age group has less adjustment levels in the life compared to the older group which was the mean focus of other researches.

6.4.3. Hypothesis – 3

There is no relationship between rehabilitation and physical dysfunctions of hemiplegia in Gaza Strip.

Rehabilitation is a wide term which uses a multidisciplinary team approach that includes a physician, nurse, psychologist, sociologist, speech therapists, physiotherapist (PT) and occupational therapist (OT). PT and OT are the most important for the hemiplegic patients in terms of physical function and role limitation due to physical health domain.

PT and OT uses many different approaches for treatment of theses dysfunctions . Dewey et al (2007) have in their research identified three principals to achieve effective stroke rehabilitation; (1) a functional approach targeted at specific activities e.g. walking, activities of daily living, (2) frequent and intense practice, and (3) commencement in the first days or weeks after stroke . In this research we will be considering the rehabilitation commencement as well as intensity.

6.4.3.1. Rehabilitation commencement:

The research results show that the hemiplegic patients have the most benefits on the physical functioning domain when they commenced rehabilitation directly after having stroke. These results support earlier principle identified by Dewey et al (2007) that for rehabilitation to be effective it should be commenced in the first days or weeks after stroke. Also these results support earlier study by Kwakkel et al (1997) who reported that variables defined on a neuromuscular level showed larger summary effect sizes than variables defined on a functional level

The research results show that the hemiplegic patients have the most benefits on the role limitation due to physical health domain when they commenced rehabilitation more than one year after having stroke. These results are contrary to an earlier study by Paolucci et al (2000) who showed a strong association between onset-admission interval and functional outcome but on the other hand, early intervention was associated with a five times greater risk of dropout than that of patients with delayed start of treatment. The researcher attribute these differences probably to the different methodology used.

6.4.3.2. Rehabilitation intensity:

The research results show that the hemiplegic patients have the most benefits on the physical functioning domain when they continued taking rehabilitation from 30 to 60 days. These results support earlier study by Weiss et al (2000) who reported that strength training is an appropriate intervention to improve the quality of physical function in older community dwelling stroke survivors.

The research results show that the hemiplegic patients have the most benefits on the role limitation due to physical health domain when they continued taking rehabilitation from 30 to 60 days. These results support earlier study by Fang et al (2003) who reported that additional early physiotherapy might improve independence of patients after hemiplegia.

6.4.4. Hypothesis - 4

There is no relationship between rehabilitation and psychological dysfunctions of hemiplegia in Gaza Strip.

The study main results show that there is a significant relationship between rehabilitation and psychological dysfunctions, in other words rehabilitation reduces psychological symptoms. These results support earlier result by Britta (1999) who reported that 64% of the stroke survivors were classified as having high scores for psychological well being or fell within the middle range after getting rehabilitation at a specialized geriatric stroke ward.

6.4.4.1. Rehabilitation commencement:

The research results show that the hemiplegic patients have the most benefits on the psychological dysfunctions when they commenced rehabilitation directly after having stroke. The researcher attributes this to the parallel benefits that hemiplegics gained in the physical functions. These results came in line with earlier study by Cumming et el (2008) who concluded that very early mobilization reduced depressive symptoms in stroke patients at 7 days post-stroke and marginally less anxious.

6.4.4.2. Rehabilitation intensity:

The research results show that the hemiplegic patients have the most benefits on the psychological dysfunctions when they continued taking rehabilitation from 30 to 60 days after the patients have started to benefit from the treatment in their activities of daily living which has been linked in many previous studies with depression and mood disorders. These results support earlier study by Jubya et al (1996) who reported that patients who received rehabilitation on stroke units were more independent in activities of daily living compared with those who received rehabilitation on conventional wards, by 6 months they were also psychologically more able to cope.

Study conclusions

The following conclusions can be drawn from the present study:

1. Rehabilitation reduces the hemiplegia physical disabilities and is more effective when commenced directly after having stroke with intensity from 30 to 60 days.

2. Rehabilitation reduces the hemiplegia psychological symptoms and is more effective when commenced directly after having stroke with intensity from 30 to 60 days.

3. The hemiplegia physical disabilities are strongly age dependent. Also these disabilities are affected by other risk factors (hypertension, psychological stresses, smoking, Hyperlipidemia, gender and diabetes mellitus) respectively. While the hemiplegia functional disabilities are affected by only hypertension and age.

4. The psychological stresses are the strongest frequency risk factor on hemiplegia psychological dysfunctions. Also the hemiplegia risk factors (hypertension, age, diabetes mellitus, smoking, Hyperlipidemia and gender) affects psychological dysfunctions respectively.

The present study emphasize the importance of multidisciplinary team rehabilitation in order to reduce hemiplegia catastrophic outcomes. Also affected patients should approach professional persons as soon as they get injured because it has been noticed that any delay can worsen the effects of hemiplegia in a way that it affects the patient and the surroundings too.

Study recommendations

Future studies should focus on including the social aspect in their research especially the role of social support for the hemiplegics on their emotional outcomes.

Future studies should focus on longitudinal studies for hemiplegics for which the possibility of follow up for the rehabilitation effect on their psychological well being can be maintained.

Future studies should involve normal population and hemiplegics for whom the possibility of comparison between them can be done regarded to accurate evaluation for the rehabilitation outcomes as well as accurate ratio for the physical and psychological dysfunctions.

Future studies should involve a more broad scales (may be FIM or Barthel index scales) for measurement of functional disabilities.

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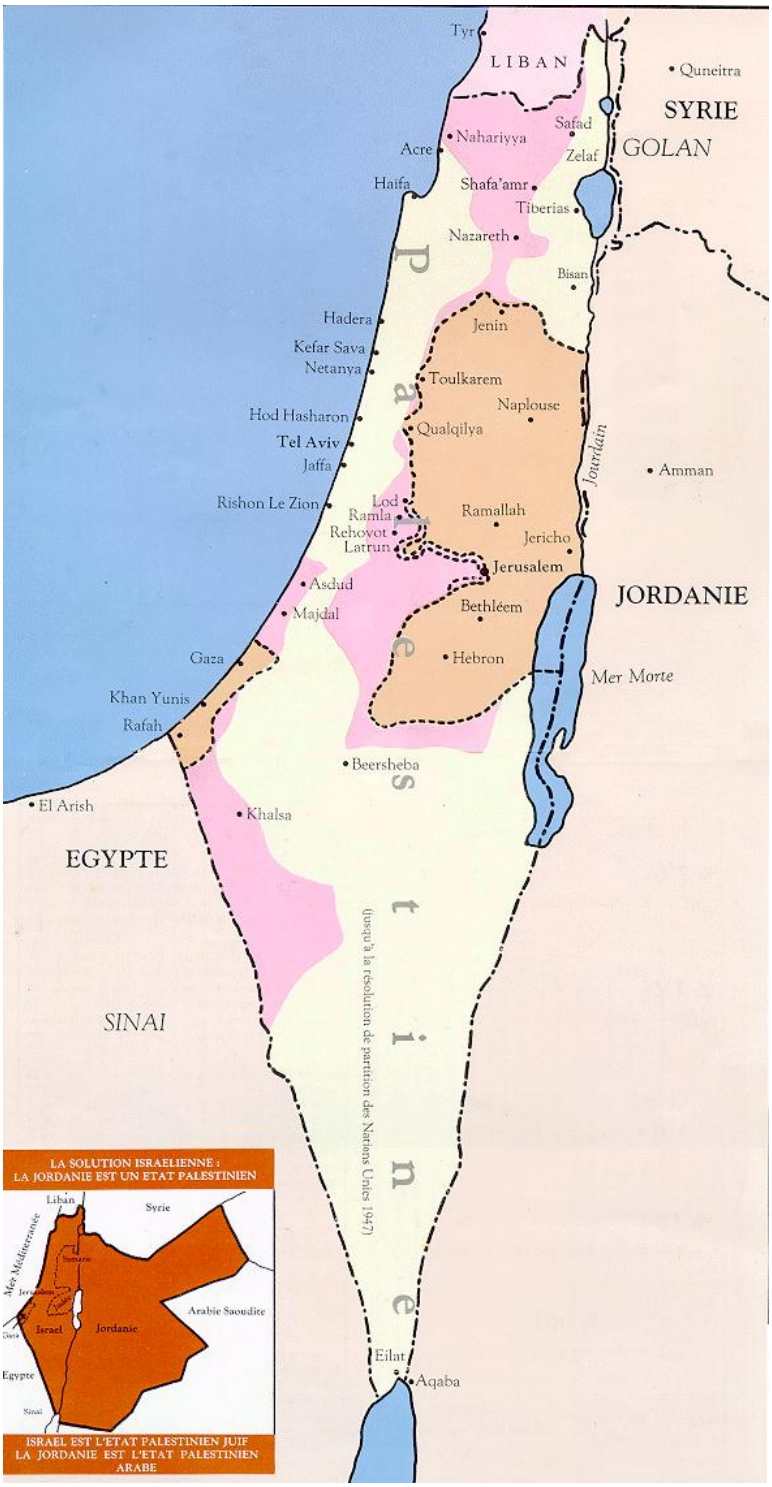
APPENDIXES

Appendix (1)

Map of Palestine

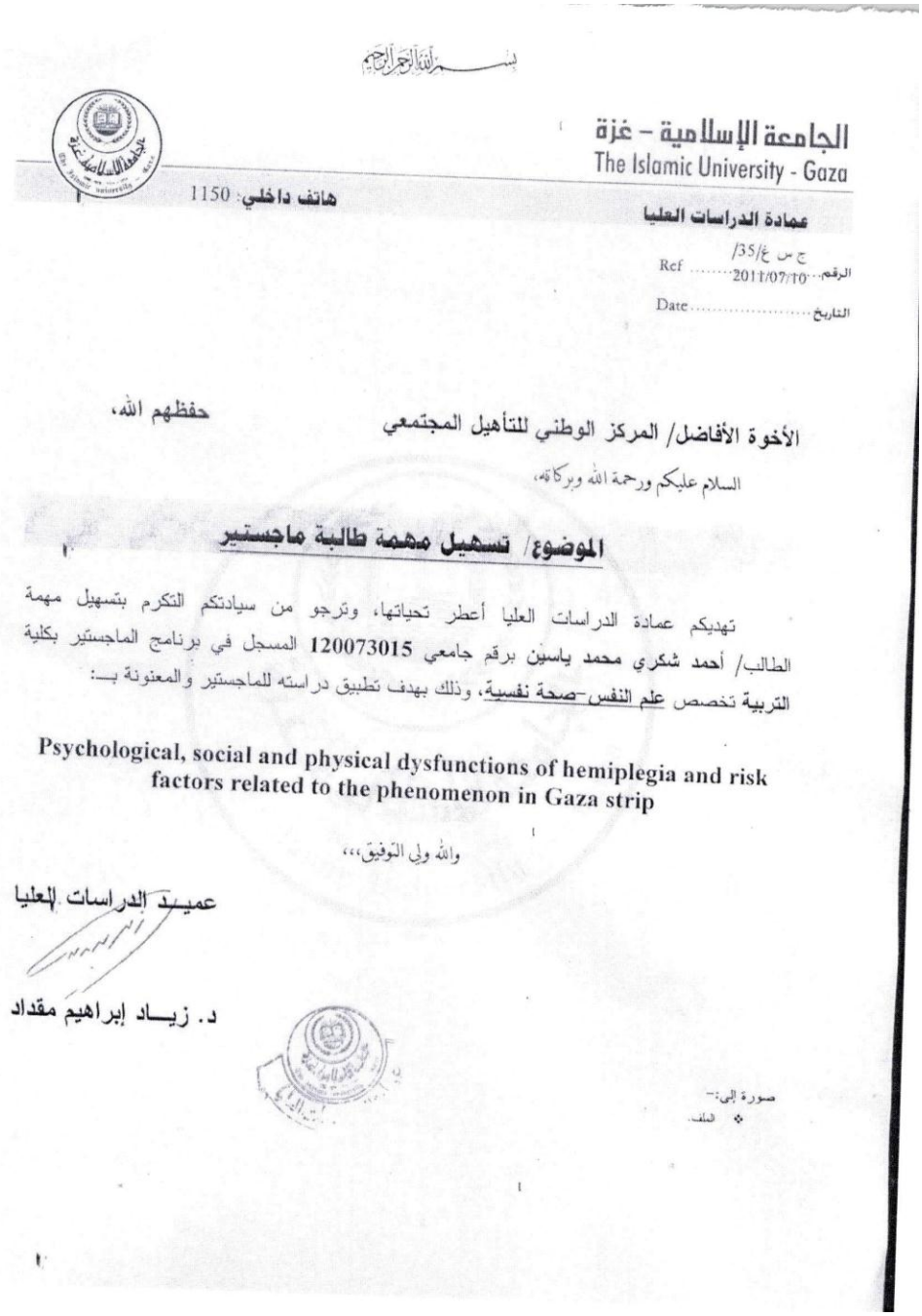


Appendix (2)

Map of Gaza strip

Appendix (3)

Ethical approval letter to national center for community rehabilitation



بسم الله الرحمن الرحيم

الجامعة الإسلامية – غزة
The Islamic University - Gaza

هاتف داخلي: 1150

عمادة الدراسات العليا

الرقم: ج س غ/35/ Ref 2011/07/10

التاريخ ..... Date

الأخوة الأفاضل/ المركز الوطني للتأهيل المجتمعي حفظهم الله،

السلام عليكم ورحمة الله وبركاته،

الموضوع/ تسهيل مهمة طالبة ماجستير

تهديكم عمادة الدراسات العليا أعطر تحياتها، وترجو من سيادتكم التكرم بتسهيل مهمة الطالب/ أحمد شكري محمد ياسين برقم جامعي **120073015** المسجل في برنامج الماجستير بكلية التربية تخصص علم النفس-صحة نفسية، وذلك بهدف تطبيق دراسته للماجستير والمعنونة بـــ:

Psychological, social and physical dysfunctions of hemiplegia and risk factors related to the phenomenon in Gaza strip

والله ولي التوفيق،،،

عميد الدراسات العليا

د. زيـــاد إبراهيم مقداد

صورة إلى:-
- الملف

Appendix (4)

Ethical approval letter for UNRWA head quarter

بسم الله الرحمن الرحيم

الجامعة الإسلامية – غزة
The Islamic University - Gaza

عمادة الدراسات العليا
هاتف داخلي: 1150

الرقم Ref ج س ع/35/ 2010/07/13
التاريخ Date

الأخ الفاضل/ مدير دائرة الصحة بوكالة الغوث حفظه الله،

السلام عليكم ورحمة الله وبركاته،

الموضوع/ تسهيل مهمة طالب ماجستير

تهديكم عمادة الدراسات العليا أعطر تحياتها، وترجو من سيادتكم التكرم بتسهيل مهمة الطالب/ **أحمد شكري محمد ياسين** برقم جامعي **120073015** المسجل في برنامج الماجستير بكلية **التربية** تخصص **علم النفس/صحة نفسية**، وذلك بهدف تطبيق أدوات دراسته والمعنونة بـــ:

Psychological, social and physical dysfunctions of hemiplegia and risk factors related to the phenomenon in Gaza strip

والله ولي التوفيق،،،

عميـــد الدراسات العليا

د. زيـــاد إبراهيم مقداد

صورة إلى:-
- الملف

P.O. Box 108, Rimal, Gaza, Palestine fax: +970 (8) 286 0800 Tel: +970 (8) 286 0700 ص.ب. 108 الرمال غزة، فلسطين فاكس هاتف
public@iugaza.edu.ps www.iugaza.edu.ps

Appendix (5)

Short Form 36

تعليمات المسح الصحي : يهدف هذا الاستبيان الصحي للتعرف على بعض الجوانب الصحية لديك لذا نرجو التكرم بقراءة الأسئلة بوضوح ووضع علامة ✓ أمام أقرب إجابة لفهمك السؤال.

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 ✓ على مربع الإجابة المناسبة)				
	الأنشطة	نعم تقيدني كثيراً	نعم تقيدني قليلاً	لا تقيدني إطلاقاً
1	**من ممارسة الأنشطة الشاقة،** مثل الجري، حمل الأشياء الثقيلة، ممارسة الأنشطة الرياضية المجهدة جداً ؟			
2	**من ممارسة الأنشطة متوسطة الجهد،** كتحريك الطاولة، أو التنظيف باستخدام المكنسة الكهربائية، أو تنظيف حديقة المنزل و العناية بها؟			
3	من حمل المشتريات من البقالة أو السوبر ماركت؟			
4	من صعود الدرج لعدة أدوار؟			
5	من صعود الدرج لدور واحد فقط؟			
6	من الانحناء، الركوع، أو السجود؟			
7	من المشي لأكثر من كيلومتر و نصف؟			
8	من المشي لمسافة نصف كيلومتر؟			
9	من المشي لمسافة مئة متر؟			
10	من الاستحمام أو ارتداء الملابس بنفسك؟			
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 ✓ على مربع الإجابة المناسبة)				
		نعم	لا	
11	التقليل من الوقت الذي تقضية في العمل أو أنشطة أخرى؟			
12	التقليل مما تود انجازه من العمل أو أي أنشطة أخرى؟			
13	تقيدك في أداء نوع معين من الأعمال أو أي أنشطة أخرى؟			
14	أن تجد صعوبة في تأدية العمل أو أي أنشطة أخرى (على سبيل المثال: تأخذ منك جهد إضافي لتأديتها)			

Appendix (6)

Short Form 36

SF36:

Instructions for completing the questionnaire: Please answer every question. Some questions may look like others, but each one is different. Please take the time to read and answer each question carefully by filling in the bubble that best represents your response.

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much? (choose one answer)

No, not limited at all	Yes, limited a little	Yes, limited a lot.	Activities	
			Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.	1
			Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?	2
			Lifting or carrying groceries	3
			Climbing several flights of stairs.	4
			Climbing one flight of stairs.	5
			Bending, kneeling or stooping.	6
			Walking more than one mile.	7
			Walking several blocks.	8
			Walking one block.	9
			Bathing or dressing yourself	10

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? (choose one answer)

No	Yes		
		Cut down the amount of time you spent on work or other activities?	11
		Accomplished less than you would like?	12
No	Yes		
		Were limited in the kind of work or other activities	13
		Had difficulty performing the work or other activities (for example, it took extra time)	14

Appendix (7)

مقياس الصحة النفسية (SCL-90-R)

يهدف هذا الاستبيان للتعرف علي رأيك حول بعض القضايا الشخصية الرجاء التكرم بالإجابة وذلك بوضع دائرة حول رمز الإجابة المناسبة لوجهة نظرك حول وجود هذه المشاكل خلال الأسبوع الماضي ، حيث يوجد أمامك عدد من المشكلات التي قد تعاني منها – يرجى اختيار رمز الإجابة التي تنطبق عليك فإذا كنت لا تعاني أبدا" عليك اختيار رمز صفر وهكذا ..

(مثال توضيحي علي ذلك الاستبيان)

1	الصداع المستمر	0	1	2	3	4

0 : لا توجد إطلاقا
1 : توجد
2 : توجد بشكل متوسط
3 : توجد بشكل كبير
4 : توجد بشكل كبير جدا

الرقم	العبارة	لا توجد إطلاقا	توجد	توجد بشكل متوسط	توجد بشكل كبير	توجد بشكل كبير جداً
1	الصداع المستمر	0	1	2	3	4
2	النرفزة والارتعاش	0	1	2	3	4
3	حدوث أفكار سيئة	0	1	2	3	4
4	الدوخان مع الاصفرار	0	1	2	3	4
5	فقدان الرغبة أو الاهتمام الجنسي	0	1	2	3	4
6	الرغبة في انتقاد الآخرين	0	1	2	3	4
7	الاعتقاد بأن الآخرين يسيطرون علي أفكاري	0	1	2	3	4
8	أعتقد بأن الآخرين مسؤولين عن مشاكلي	0	1	2	3	4

9	الصعوبة في تذكر الأشياء	0	1	2	3	4
10	الانزعاج بسبب الإهمال وعدم النظافة	0	1	2	3	4
11	يسهل استثارتي بسهولة	0	1	2	3	4
12	الألم في الصدر والقلب	0	1	2	3	4
13	الخوف من الأماكن العامة والشوارع	0	1	2	3	4
14	الشعور بالبطيء وفقدان الطاقة	0	1	2	3	4
15	تراودني أفكار للتخلص من الحياة	0	1	2	3	4
16	أسمع أصوات لا يسمعها الآخرون	0	1	2	3	4
17	أشعر بالارتجاف	0	1	2	3	4
18	عدم الثقة بالآخرين	0	1	2	3	4
19	فقدان الشهية	0	1	2	3	4
20	البكاء بسهولة	0	1	2	3	4
21	الخجل وصعوبة التعامل مع الآخرين	0	1	2	3	4
22	أشعر باني مقبوض أو ممسوك أو مكبل	0	1	2	3	4
23	الخوف فجأة وبدون سبب محدد	0	1	2	3	4
24	عدم المقدرة علي التحكم في الغضب	0	1	2	3	4
25	أخاف أن أخرج من البيت	0	1	2	3	4
26	نقد الذات لعمل بعض الأشياء	0	1	2	3	4
27	الألم في أسفل الظهر	0	1	2	3	4
28	أشعر بان الأمور لا تسير علي ما يرام	0	1	2	3	4
29	أشعر بالوحدة	0	1	2	3	4
30	أشعر بالحزن " الاكتئاب "	0	1	2	3	4
31	الانزعاج علي الأشياء بشكل كبير	0	1	2	3	4
32	فقدان الأهمية بالأشياء	0	1	2	3	4

33	الشعور بالخوف	0	1	2	3	4
34	أشعر بأنه يسهل إيذائي	0	1	2	3	4
35	اطلاع الآخرين علي أفكاري الخاصة بسهولة	0	1	2	3	4
36	الشعور بأن الآخرين لا يفهمونني	0	1	2	3	4
37	الشعور بأن الآخرين غير ودودين	0	1	2	3	4
38	أعمل الأشياء ببطيء شديد	0	1	2	3	4
39	زيادة ضربات القلب	0	1	2	3	4
40	ينتابني غثيان واضطرابات في المعدة	0	1	2	3	4
41	مقارنة بالآخرين أشعر باني أقل قيمة منهم	0	1	2	3	4
42	عضلاتي تتشنج	0	1	2	3	4
43	أشعر بأني مراقب من قبل الآخرين	0	1	2	3	4
44	صعوبة النوم	0	1	2	3	4
45	أفحص ما أقوم به عدة مرات	0	1	2	3	4
46	أجد صعوبة في اتخاذ القرارات	0	1	2	3	4
47	الخوف من السفر	0	1	2	3	4
48	صعوبة التنفس	0	1	2	3	4
49	السخونة والبرودة في جسمي	0	1	2	3	4
50	أتجنب أشياء معينة	0	1	2	3	4
51	الشعور بعدم القدرة علي التفكير	0	1	2	3	4
52	الخدر والنمنمة في الجسم	0	1	2	3	4
53	الشعور بانغلاق الحلق وعدم المقدرة علي البلع	0	1	2	3	4
54	فقدان الأمل في المستقبل	0	1	2	3	4
55	صعوبة التركيز	0	1	2	3	4
56	ضعف عام في أعضاء جسمي	0	1	2	3	4

57	أشعر بالتوتر	0	1	2	3	4
58	الشعور بالثقل باليدين والرجلين	0	1	2	3	4
59	الخوف من الموت	0	1	2	3	4
60	الإفراط في النوم	0	1	2	3	4
61	اشعر بالضيق عند وجود الآخرين ومراقبتهم لي	0	1	2	3	4
62	توجد عندي أفكار غريبة	0	1	2	3	4
63	اشعر بالرغبة في إيذاء الآخرين	0	1	2	3	4
64	استيقظ من النوم مبكرا"	0	1	2	3	4
65	إعادة نفس الأشياء عدة مرات	0	1	2	3	4
66	أعاني من النوم المتقطع والمزعج	0	1	2	3	4
67	الرغبة في تكسير وتحطيم الأشياء	0	1	2	3	4
68	توجد لدي أفكار غير موجودة عند الآخرين	0	1	2	3	4
69	حساسية زائدة في التعامل مع الآخرين	0	1	2	3	4
70	الخوف من التواجد في التجمعات البشرية	0	1	2	3	4
71	كل شئ يحتاج إلى مجهود كبير	0	1	2	3	4
72	اشعر بحالات من الخوف والتعب	0	1	2	3	4
73	اشعر من الخوف من التواجد في الأماكن العامة	0	1	2	3	4
74	كثرة الدخول في الجدل والنقاش الحاد	0	1	2	3	4
75	أشعر بالنرفزة عندما أكون وحيدا"	0	1	2	3	4
76	الآخرون لا يقدرون أعمالي	0	1	2	3	4
77	اشعر بالوحدة حتى عندما أكون مع الناس	0	1	2	3	4
78	الشعور بالضيق وكثرة الحركة	0	1	2	3	4
79	اشعر بأني غير مهم	0	1	2	3	4
80	اشعر بأن أشياء سيئة سوف تحدث لي	0	1	2	3	4

81	الصراخ ورمي الأشياء	0	1	2	3	4
82	أخاف من أن افقد الوعي أمام الآخرين	0	1	2	3	4
83	اشعر بان الآخرين سيستغلونني	0	1	2	3	4
84	يزعجني التفكير في الأمور الجنسية	0	1	2	3	4
85	تراودني أفكار بأنه يجب معاقبتي	0	1	2	3	4
86	توجد عندي تخيلات وأفكار غريبة	0	1	2	3	4
87	اعتقد بأنه يوجد خلل في جسمي	0	1	2	3	4
88	اشعر باني غير قريب وبعيد من الآخرين	0	1	2	3	4
89	الشعور بالذنب	0	1	2	3	4
90	عندي مشكلة في عقلي " نفسي "	0	1	2	3	4

Appendix (8)

Mental Health Scale (SCL-90-R)

Attached is a list of problems and complaints that people have. Please read each one carefully. After you have done so, please fill in the number (0 to 4 see below) which best describes how much that problem has bothered or distressed you during the past 4 weeks including today. Choose only one number for each problem and do not skip any items. If you change your mind, erase your first answer and fill a new one. All questionnaires will be treated confidentially.

(example)

4	3	2	1	0	Headaches	1

0: not at all

1: a little bit

2: moderately

3: quite a bit

4: extremely

extremely	quite a bit	moderately	a little bit	not at all	Statement	No.
4	3	2	1	0	Headaches	1
4	3	2	1	0	Nervousness or shakiness inside	2
4	3	2	1	0	Unwanted thoughts or ideas that won't your head	3
4	3	2	1	0	Faintness or dizziness	4
4	3	2	1	0	Loss of sexual interest or pleasure	5
4	3	2	1	0	Feeling critical of others	6
4	3	2	1	0	The idea that someone else can control your thoughts	7
4	3	2	1	0	Feeling others are to blame for most of your troubles	8
4	3	2	1	0	Trouble remembering things	9
4	3	2	1	0	Worried about sloppiness or carelessness	10
4	3	2	1	0	Feeling easily annoyed or irritated	11
4	3	2	1	0	Pains in heart or chest	12
4	3	2	1	0	Feeling afraid in open spaces or on the street	13
4	3	2	1	0	Feeling low in energy or slowed down	14
4	3	2	1	0	Thoughts of ending life	15
4	3	2	1	0	Hearing voices that other people do not hear	16
4	3	2	1	0	trembling	17
4	3	2	1	0	Feeling that most people cannot be trusted	18
4	3	2	1	0	Poor appetite	19
4	3	2	1	0	Crying easily	20
4	3	2	1	0	Feeling shy or uneasy with the opposite sex	21

4	3	2	1	0	Feeling of being trapped or caught	22
4	3	2	1	0	Suddenly scared for no reason	23
4	3	2	1	0	Temper outbursts that you could not control	24
4	3	2	1	0	Feeling afraid to go out of your house alone	25
4	3	2	1	0	Blaming yourself for things	26
4	3	2	1	0	Pains in lower back	27
4	3	2	1	0	Feeling blocked in getting things done	28
4	3	2	1	0	Feeling lonely	29
4	3	2	1	0	Feeling blue	30
4	3	2	1	0	Worrying too much about things	31
4	3	2	1	0	Feeling no interest in things	32
4	3	2	1	0	Feeling fearful	33
4	3	2	1	0	Your feelings being easily hurt	34
4	3	2	1	0	Other people being aware of your private thoughts	35
4	3	2	1	0	Feeling others do not understand you or are unsympathetic	36
4	3	2	1	0	Feeling that people are unfriendly	37
4	3	2	1	0	Having to do things very slowly	38
4	3	2	1	0	Heart pounding or racing	39
4	3	2	1	0	Nausea or upset stomach	40
4	3	2	1	0	Feeling inferior to others	41
4	3	2	1	0	Soreness of your muscles	42
4	3	2	1	0	Feeling that you are watched or talked about by others	43

4	3	2	1	0	Trouble falling a sleep	44
4	3	2	1	0	Having to check or double check what you do	45
4	3	2	1	0	Difficulty making decisions	46
4	3	2	1	0	Feeling afraid to travel on buses, subways or trains	47
4	3	2	1	0	Trouble getting your breath	48
4	3	2	1	0	Hot or cold spells	49
4	3	2	1	0	Having to avoid certain things, places or activities	50
4	3	2	1	0	Your mind going blank	51
4	3	2	1	0	Numbness or tingling in parts of your body	52
4	3	2	1	0	A lump in your throat	53
4	3	2	1	0	Feeling hopeless about the future	54
4	3	2	1	0	Trouble concentration	55
4	3	2	1	0	Feeling weak in parts of your body	56
4	3	2	1	0	Feeling tense or keyed up	57
4	3	2	1	0	Heavy feeling in your arms or legs	58
4	3	2	1	0	Thoughts of death or dying	59
4	3	2	1	0	Over sleeping	60
4	3	2	1	0	Feeling easy when people are watching or talking about you	61
4	3	2	1	0	Having thoughts that are not your own	62
4	3	2	1	0	Having urges to beat, injure or harm someone	63
4	3	2	1	0	Awakening in the early morning	64
4	3	2	1	0	Having to repeat the same actions such as touching, counting, washing	65

4	3	2	1	0	Sleep that is restless or disturbed	66
4	3	2	1	0	Having urges to break or smash things	67
4	3	2	1	0	Having ideas or beliefs that others do not share	68
4	3	2	1	0	Feeling very self conscious with others	69
4	3	2	1	0	Feeling uneasy in crowds such as shopping or at a movie	70
4	3	2	1	0	Feeling every thing is an effort	71
4	3	2	1	0	Spells of terror or panic	72
4	3	2	1	0	Feeling uncomfortable eating or drinking in public	73
4	3	2	1	0	Getting into frequent arguments	74
4	3	2	1	0	Feeling nervous when you are left alone	75
4	3	2	1	0	Others not giving you proper credit for your achievements	76
4	3	2	1	0	Feeling lonely even when you are with people	77
4	3	2	1	0	Feeling so restless you couldn't sit still	78
4	3	2	1	0	Feeling of worthlessness	79
4	3	2	1	0	Feeling that familiar things are strange or unreal	80
4	3	2	1	0	Shouting or throwing things	81
4	3	2	1	0	Feeling afraid you will faint in public	82
4	3	2	1	0	Feeling that people will take advantage of you if you let them	83
4	3	2	1	0	Having thoughts about sex that bother you	84
4	3	2	1	0	The idea that you should be punished for your sins	85
4	3	2	1	0	Feeling pushed to get things done	86

4	3	2	1	0	The idea that something serious is wrong with your body	87
4	3	2	1	0	Never feeling close to another personal	88
4	3	2	1	0	Feelings of guilt	89
4	3	2	1	0	The idea that something is wrong with your mind	90

Appendix (9)

Covering letter and consent form

يقوم الباحث أحمد شكري ياسين بتحضير رسالة الماجستير حول الخلل النفسي, الجسدي و عوامل الخطر لدى مرضى الشلل النصفي الطولي في قطاع غزة, و لأجل تحقيق ذلك قام بتحضير مجموعة من الأسئلة و التي نرجو منك التعاون معنا و الإجابة عليها علما بأن الإجابات سوف تدخل على الكمبيوتر و لن يطلع عليها أحد و أستطيع أن أتعهد لك بذلك.

أرجو أن توافق على الاشتراك و التعاون معنا في إنجاز هذه الدراسة علما بأن مردودها سوف يكون للمجتمع الفلسطيني.

هل توافق على المشاركة في هذه الدراسة علما بأنه من حقك الامتناع عن الإجابة عن أي سؤال في الاستبيان, و يمكنك الانسحاب من الدراسة في أي وقت تشاء.

☐ أوافق

☐ لا أوافق

الباحث : أحمد شكري ياسين

محاضر بجامعة الأقصى - غزة

جوال رقم :0599724302

البريد الكتروني: shokryys@hotmail.com

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

الباحث