

The Effect of Massage Therapy on Pain and Anxiety Reduction among Stroke Patients

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Abstract: Pain and anxiety may be experienced by stroke patients. This is generally a result of stiff joints, muscle tension and cramps. Massage of the muscles can stimulate blood flow and consequently improved overall mobility and relief pain and reduce anxiety. **Aim:** The Effect of Massage Therapy on pain and Anxiety among Stroke Patients. **Subjects and Methods:** A convenience sample of 100 patients with stroke. The study was carried out at special medical department and Clinic in Shebien Elkoom, at Menoufia University Hospital, Egypt. Tools Three tools were utilized for data collection. **Tool I: Interviewing questionnaire:** developed by the researchers It consisted of:- Part one: Socio demographic data, Part two: Assessment of knowledge about medical data about stroke. **Tool II: ABBEY PAIN SCALE:** that contains sex questions for measuring pain relief. **Tool III: Hamilton Anxiety Rating scale (HAM-A).** That contains 14 questions for measuring rate of anxiety. **Results:** The majority of both study and control groups were male, were secondary education, were married and were Ischemic stroke. The majority of study group had improvement to pulse and blood pressure during post and follow intervention also highly statistically significant difference was evident among two studied group as regard to pulse and blood pressure. A highly statistical significant difference was evident among two studied group as regard to post and follow pain and anxiety level. Also the majority of study group had improvement to pain and anxiety level during post and follow intervention than pre intervention. **Conclusion:** The current study concluded that improvement of pain and anxiety level by massage in post and follow up intervention than pre intervention. Also there were statistically significant improvements on blood pressure and heart rate by massage post and follow up intervention than pre intervention. The current study showed that positive correlation between pain and anxiety level in follow up intervention.

Keywords: Massage, pain, anxiety, stroke.

1. INTRODUCTION

A stroke (known as cerebrovascular disease) is a sudden loss of brain function that results when the blood supply to the brain is suddenly disrupted. Blood is carried to the brain by blood vessels called arteries, when blocked by plaque, a clot, or they burst altogether, blood may no longer be able to move through it. Brain damage or even death may then occur as the brain cannot survive without a continuous flow of nutrient-rich blood. Stroke is the second leading cause of death worldwide after coronary heart disease, accounting for 10% of all deaths. Stroke is also the most common cause of disability in elderly people. (Nikupaavo, 2007.)

Hypertension was the most frequent risk factor in stroke patients from Arab countries, being present in 24.9–76% of reported patients. Diabetes mellitus was present in 11.6–69.4%. Hyperlipidaemia was reported in 4–61% of patients. Other risk factors were as follows: cardiac disease 5–50% cigarette smoking 1.6–44%. It can be caused by a change in the blood flow to the brain, or an actual rupture of the blood vessels feeding the brain. In rare cases, a cardiac arrest can also cause stroke-like damage to the brain. Without oxygen and a continuous flows of blood and nutrients to the brain, the greater the likelihood of brain damage. Depending on where the damage has occurred in the brain, the effects of a stroke

can vary widely. It can affect physically (weakness, paralysis, movement limitations, pain, fatigue, sleep problems) emotionally (fluctuating emotions, anxiety, depression), and mentally as thinking, talking and memory difficulties (**Hamdy et al.,2013**).

If damage occurred in the left hemisphere of the brain, some of the effects might include weakness or paralysis on the right side of the body. Trouble in reading, talking, thinking or solving the problems. If damage occurred in the right hemisphere of the brain, some of the effects might include weakness or paralysis on the left side of body. Massage is a general term for pressing, rubbing and manipulating skin, muscles, tendons and ligaments. Massage therapists typically use their hands and fingers for massage, but may also use their forearms, elbows and even feet. Massage may range from light stroking to deep pressure (**Strong K, Mathers, et al., 2007**).

Massage therapy has a long history, being first described in China during the second century and soon thereafter in India and Egypt. More recently, massage therapy has been administered using mechanical devices in addition to hands-on treatment by therapists. Massage can be applied to single or multiple body parts or to the entire body. There are many different types of massage therapy including Swedish massage, Shiatsu, Rolfing, reflexology and craniofacial therapy. Most of the published trials on massage therapy have utilized Swedish or Swedish-type massage (**Jennie, 2007**).

Rehabilitation for stroke patients typically involves physical therapy, speech therapy and/or occupational therapy. Unfortunately, massage therapy is rarely mentioned as one of the therapies of choice. Massage helps someone who has experienced a stroke. At the very least, we know that massage helps to relax, reduce stress, improve circulation, and decrease pain. The patients who received tactile massage experienced a significantly higher quality of life, showed an improvement in general hygiene and mobility, and used less medication, in particular for pain and depression (**Tsao JC, 2005**).

So massage really benefits people who have had a stroke. Talk to someone who has had a stroke, and learn how difficult it is to deal with the numerous effects of a stroke. Using massage therapy help them to relax, decrease pain, and comfort them. Massage also helps to increase circulation to areas in the body that have been affected by a stroke. Also, some massage clinics and massage therapists specialize in home or hospital visits if should require the services of a professional therapist (**Franke A, 2006**).

Therapeutic massage increased mental and physical relaxation, improved circulation, pain relief, accelerated healing from injury and illness, and improvement in the quality of sleep. In addition, when performed by our trained massage therapists, it can provide symptomatic relief from many common conditions that occur with age such as arthritis, diabetes, chronic back pain, fibromyalgia, Parkinson's disease, cancer, stroke and Alzheimer's disease. It's beautifully simple therapeutic massage can enable older adults to extend the vitality and quality of their lives. Just think about the simple pleasure of human touch and company (**Wylie KR, 2000**).

Massage can help improve Insomnia experienced in creating a more relaxed state for the person both physically and mentally. It also activates the parasympathetic nervous system responsible for allowing. Gentle massage can stimulate circulation and internal organs and create warmth. Extremities such as hands and feet may be swollen, achy or cold due to an accumulation of lactic acid in the muscles caused by decreased mobility in someone who has had a stroke. The good circulation stimulated by massage delivers oxygen-rich blood to these damaged, tense muscles, which is exactly what they need to heal. Massage can increase the levels of energy and assist the stroke patients in conserving it. It releasing muscle tension and toxins in the muscles and reducing the stress hormone called cortisol (**Galls, 2011**).

The available studies on massage and blood pressure usually have different and sometimes contradictory results; some of the researchers believed massage is effective on reduction of the systolic and diastolic blood pressure, some others stated that its effect depends upon some certain conditions such as BMI or certain types of massage in certain areas, and some believed massage is effective on systolic blood pressure and effect on diastolic blood pressure needs applying massage in a long term period. Many of the results of the comparative articles indicated that nurses are more competent in control and management of the blood pressure than other health staff team (**Mok E,et al., 2009**).

Pain may be experienced by stroke patients. This is generally a result of stiff joints, muscle tension and cramps. Stiff joints may be alleviated by gentle massage as muscles surrounding the soft tissues surrounding the joint receive better blood supply from an increase in blood circulation. Increased circulation from massage therapy can also help to alleviate

cramps, as they are usually the result of the muscle not receiving adequate blood flow. Emotional problems may develop alongside physical ones after a person has had a stroke. Previous day to day activities can no longer be carried out, and depression may occur (van den Dolder PA, et al. 2003).

Recent scientific research has shown massage to have a beneficial effect when carried out on those suffering from Depression. Massage adds the therapeutic value in physically stimulating the nerve receptors of the nervous system, which in turn causes a release of the mood-lifting chemicals serotonin or dopamine into the body. Other internal chemicals associated with stress, such as adrenaline that reduced with massage and counteract the depression. The day to day quality of a stroke patient's life may be improved by massage (Haraldsson BG, et al., 2006).

2. SIGNIFICANCE OF THE STUDY

Massage is various physiologic, mechanical or psychological effects to counteract the many imbalances that occur within soft tissue. Despite advances in medical care of stroke and the advent of treatment of selected patients with acute ischemic stroke, the massage therapy can be used as an effective nursing intervention in control pain and anxiety in stroke patients. Data are available on Middle East and the developing countries of the African continent. Stroke is the second cause of death, preceded only by heart diseases, with significant morbidity and mortality. In Egypt, the incidence of stroke was found to be 2.1 per 1000 population, whereas the prevalence was 5.4 per 1000 population. The burden of cerebrovascular diseases in developing countries is rising sharply. The risk of stroke has increased 100% in low and middle income countries over the last decade and the developing world accounts for 85.5% of mortality due to all stroke deaths worldwide (Hamdy et al.,2013). So the aim of the study shows the effect of massage therapy on pain and anxiety reduction among stroke patients.

Aim of the study:

The aim of the study was to examine the effect of massage therapy on pain and anxiety reduction among stroke patients.

Research Hypotheses:

- 1- There will be reduction and improvement of pain in the study group than control group.
- 2- There will be reduction and improvement of anxiety in the study group than control group.

Design:

A quasi experimental design was utilized

Setting:

The study was carried out at special medical department and Clinic at Menoufia University and teaching Hospitals in shebien Elkoom in Egypt.

Subjects:

A convenience sample of 100 patients with stroke that was available during the time of data collection, in the previously mentioned setting was selected according to the following criteria:

- Adult patients
- No contraindication to perform massage.
- Patients have not severe complication interact with massage therapy.

Tools:

Three tools were used and utilized by the researchers

Tool 1: Structured interviewing questionnaire: developed by the researchers to assess patient's medical data and knowledge. It consisted of:-

Part one: Socio demographic data such as age, marital status, education level, occupation living place and smoking.

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Part two: Assessment of patient's about disease process (causes, vital signs, complication, stroke type and level of consciousness).

Tool II: ABBEY PAIN SCALE: This scale was developed by (Abbey, et al., 2004). It was used for measurement of pain in people with dementia who cannot verbalize. The tool attempts to measure severity of acute pain and chronic pain. It contains six items (vocalization, facial expression, change in body language, behavioral change, physiological change and physical changes). **Scoring system.** Each item is leveled on a four point scale for severity (Absent: 0; Mild: 1; Moderate: 2; Severe 3). Individual item scores are summed to arrive at a total score ranging from 0-18. The total score is interpreted as follows: No pain: 0- 2; Mild: 3-7; Moderate: 8-13; Severe: 14+.

Tool III: Hamilton Anxiety Rating scale (HAM-A). It developed by (Hamilton, 1959). It was used for measurement of anxiety state. It contains 14 items that ranged from 0 (not present) 1(mild anxiety) 2 (moderate anxiety) 3 (severe anxiety) 4 (very severe anxiety).

Scoring system: Total score range from 0- 56, where less than 17 indicates mild anxiety, 18- 24 moderate anxiety, 25- 30 severe, more than 30 very severe.

3. METHOD

- **Administrative and ethical consideration:** An official letter from faculty of nursing was delivered to responsible authorities of hospital and approval was obtained to conduct this study after explanation of the purpose of the study.
- **Tools development:** the first tool was developed by the researchers after extensive review of the relevant literature, while the second tool was developed by (Abbey, et al., 2002) and the third tool was developed by (Hamilton, 1959). All tools 1, 2, 3 were tested for content validity by two experts in the field of nursing specialty and three experts in field of surgery. Modifications were done to ascertain relevance and completeness.
- **Consent:** Written consent was obtained from patients to participate in the study. The researchers initially introduced themselves to all potential subjects and they were assured that the collected data were absolutely confidential.
- **Reliability of the tools:** All tools were tested; by intra-class correlation coefficient: was used. It was .8 for tool I, 0.44 to 0.63 for tool II and 4. 2 for tool III.
- **Pilot study:** A pilot study was conducted on 10 patients to test feasibility, clarity and applicability of the tools then necessary modifications were done accordingly. Data obtained from the pilot study were not included in the current study.
- **Data collection:** was extended from December 2014 to march 2015.

The researcher collected data to study group in four consecutive phases namely: assessment, planning, implementation and evaluation.

1. Assessment phase: The aim of this phase was to assess sociodemographic data and knowledge about disease process by using (tool I). Each members of study and control group was observed two times in the morning shift using tool II and III.

2- Planning phase: Individuized plane for each participant from study group was developed based on the findings of assessment and review of related literature. It included the goals, expected outcome and methods of applying massage. A colored booklet was developed and it contain (purpose of massage therapy, types of massage and sites of implementation of massage on the patients)

3- Implementation phase: During this period massage therapy was given to the study group according to patient condition. Moreover booklet designed and was distributed to each one in the study group. The proposal was implemented in 2 sessions, each session last for 45- 60 minutes.

First session: stressed mainly about sociodemographic data, also know stage of disease, level of consciousness and complication. The researcher explains goals and purpose of massage, techniques of massage, effect of massage on pain and anxiety.

Second session: This study was performed using the techniques of massage stroke level for 15 minutes with soothing baby oil on the legs (quadriceps muscles and legs), hands (palms up to the end of the shoulder) and back (the first vertebra of the spine to the spine). It was conducted in four sessions in 5 consecutive days, during the hours of 10 am to 1 pm.

- Patients in the control group had all of the conditions of the case group, without any intervention. After Apply massage on the study patients and observe reaction on patients, observe pain and anxiety level. Teaching was done through discussion, demonstration, redemonstration by using members of family; booklet was used as a media for clarification and more clarification.

4- Evaluation phase: every participant's of study and control groups were assessed two times during the research period using three tools (1, 2, and 3) pre intervention, post and follow up intervention.

Statistical analysis:

Results were statistically analyzed by statistical package SPSS version 20 (SPSS Inc., Chicago Ill). For quantitative variable, Student's t-test and ANOVA (F test) were used for parametric data. Kruskal-Wallis and Mann-Whitney test were used for a non-parametric data. Chi-Squared (χ^2) was used for qualitative variable. $P < 0.05$ was considered Significant.

4. RESULTS

Table (1) shows socio-demographic characteristics of both study and control groups. it was found that, (54.0% & 70.0) were in the age group (40-60) years, The majority of both study and control groups were male (82.0% & 70.0% respectively), were secondary education (40.0% & 38.0% respectively), and were married (78.0% & 72.0% respectively). It is also observed that, most of the patients in the study and control groups had administrative work (24.0% & 38.0% respectively) and had smoked (72.0% & 52.0% respectively). No statistical significant differences were found between study and control group regarding socio-demographic data.

Table (2) shows distribution of patients sample according to their current condition of both study and control groups. It was found that, (58.0% & 50.0) were Ischemic, The majority of both study and control groups were Semi-conscious (48.0% & 64.0% respectively). It is also observed that, most of the patients in the study and control groups had Hemiplegic (52.0% & 42.0% respectively) and majority had problems associated with pain. No statistical significant differences were found between study and control group regarding Patients data.

Table (3): illustrated that comparison between study and control groups regarding to pulse (pre, post and follow intervention). The finding revealed that the highest percentage of the sample had tachycardia (80%, 82% respectively) in pre pulse, where the highest percentage had normal pulse during post and follow intervention (46%, 100% respectively) in study group as compared to control group (8%). No statistically significant differences were observed between study and control groups pre pulse ($\chi^2=0.60$, $p=0.740$). A highly statistically significant difference was evident among two studied group as regard to pulse during post and follow intervention ($p=0.001$).

Table (4): illustrated that comparison between study and control groups regarding to Systole and diastole (pre, post and follow intervention). The finding revealed that the highest percentage of the sample had moderate level (48%, 32%, 42.0%, 34.0 % respectively) in pre systole and diastole, where the highest percentage had normal systole and diastole during post and follow intervention (64%, 92%, 28%, 84% respectively) in study group as compared to control group (8%, 6%, 4%, 8% respectively). No statistically significant differences were observed between study and control groups pre systole and diastole ($\chi^2=3.48$, $p=0.322$, $\chi^2=0.97$, $p=0.807$). A highly statistically significant difference was evident among two studied group as regard to systole and diastole during post and follow intervention ($p=0.001$).

Table (5) showed that mean post and follow pain level of study group (5.18 ± 2.32 , 1.58 ± 0.85 respectively) compared to control group (9.92 ± 1.27 , 8.02 ± 1.65 respectively) and majority of the sample had moderate pain pre intervention of the two group that was decreased to majority of study group during post and follow intervention (12%, 90% respectively) had no pain and (70%, 10% respectively) had mild pain. A highly statistical significant difference was evident among two studied group as regard to post and follow pain level ($p=0.001$).

Table (6) illustrated that the highest mean of post and follow anxiety scores in study group (17.42 ± 2.37 , 13.66 ± 2.23 respectively) as compared to (23.68 ± 3.48 , 22.18 ± 2.77 respectively) in control group and majority of the sample had

moderate anxiety pre intervention of the tow group that was decreased to majority of study group during post and follow intervention had no anxiety (4.0%, 50 respectively) and mild anxiety (42.0%, 44.0% respectively). A highly statistical significant difference was evident among two studied group as regard to post and follow anxiety level (p=0.001).

Figure (1) there was highly statistically significant differences between pre, post and follow intervention regarding pain and anxiety score levels in study group.

Table (7) illustrated that there was highly statistically significant difference only between pain score and marital status while there were no statistically significant difference between pain score and age, sex, education, occupation, and Smoking.

Table (8) illustrated that there was highly statistically significant difference only between anxiety score and sex, education and marital status while there were no statistically significant difference between anxiety score and age, occupation, and Smoking.

Table (9), found that there was highly statically significant positive relationship between pain and anxiety (.001) i.e., when anxiety increased, pain increased.

Table (1): Socio demographic characteristics of the study and control group

	Groups				χ^2 Test	P- value
	Study (N=50)		Controls (N=50)			
	No	%	No	%		
Age (Y)						
40-60	27	54.0	35	70.0	2.71	0.099
>60	23	46.0	15	30.0		
Sex :					1.97	0.160
Male	41	82.0	35	70.0		
Female	9	18.0	15	30.0		
Marital status :					1.12	0.772
Married	39	78.0	36	72.0		
Single	4	8.0	4	8.0		
Divorced	4	8.0	4	8.0		
Widow	3	6.0	6	12.0		
Education :					22.09	<0.001
Illiterate	12	24.0	12	24.0		
Read and write	8	16.0	7	14.0		
Basic	0	0.0	12	24.0		
Secondary	20	40.0	19	38.0		
High	10	20.0	0	0.0		
Occupation :					7.72	0.102
Unskilled	14	28.0	12	24.0		
Skilled	10	20.0	13	26.0		
Administrative	12	24.0	19	38.0		
Housewife	9	18.0	6	12.0		
Not working	5	10.0	0	0.0		
Smoking:					0.19	0.663
Yes	36	72.0	26	52.0		
No	14	28.0	24	48.0		

Table (2): distribution of patients in the study sample according to their current condition

	Groups				χ^2 Test	P- value
	Study (N=50)		Controls (N=50)			
	No	%	No	%		
Stroke type:						
Hemorrhagic	21	42.0	25	50.0	0.64	0.442
Ischemic	29	58.0	25	50.0		
Level of consciousness						
Conscious	18	36.0	12	24.0	2.62	0.269
Semi-conscious	24	48.0	32	64.0		
Unconscious	8	16.0	6	12.0		
Complications :						
No	1	2.0	0	0.0	10.90	0.028
Speech problems	11	22.0	10	20.0		
Hemiplegia	26	52.0	21	42.0		
Facial paralysis	5	10.0	17	34.0		
Amnesia	7	14.0	2	4.0		
Problems associated with pain						
Sleep problem	11	22.0	17	34.0	10.46	0.015
Visual problem	8	16.0	15	30.0		
Activity problem	10	20.0	11	22.0		
Feeling pain in all body	21	42.0	7	14.0		

Table (3): Pulse (pre, post and follow intervention) among study and control group

	Groups				Test	P- value
	Study (N=50)		Controls (N=50)			
	No	%	No	%		
Pulse pre						
Normal	5	10.0	6	12.0	χ^2 0.60	0.740
Tachycardia	40	80.0	41	82.0		
Bradycardia	5	10.0	3	6.0		
Pulse post						
Normal	23	46.0	4	8.0	χ^2 18.55	<0.001
Tachycardia	28	52.0	43	86.0		
Bradycardia	1	2.0	3	6.0		
Pulse follow-up						
Normal	50	100.0	4	8.0	χ^2 85.18	<0.001
Tachycardia	0	0.0	43	86.0		
Bradycardia	0	0.0	3	6.0		
Pulse					t test	
Pre	107.82±19.65		108.24±15.61		0.11	0.906
Post	96.76±13.91		108.38±15.06		4.01	<0.001
Follow-up	86.50±8.86		109.14±14.85		9.25	<0.001

Table (4): Systole and diastole (pre, post and follow intervention) among study and control group

	Groups				χ^2 Test	P-Value
	Study (N=50)		Controls (N=50)			
	No	%	no	%		
Systole (pre)						
Normal	6	12.0	10	20.0	3.48	0.322
Mild	13	26.0	13	26.0		
Moderate	24	48.0	16	32.0		
High	7	14.0	11	22.0		
Systole (post)						
Normal	32	64.0	4	8.0	40.64	<0.001
Mild	14	28.0	18	36.0		
Moderate	4	8.0	23	46.0		
High	0	0.0	5	10.0		
Systole follow-up						
Normal	46	92.0	3	6.0	74.56	<0.001
Mild	4	8.0	31	62.0		
Moderate	0	0.0	15	30.0		
High	0	0.0	1	2.0		
Diastole (pre)						
Normal	4	8.0	8	16.0	0.97	0.807
Mild	13	26.0	13	26.0		
Moderate	21	42.0	17	34.0		
High	12	24.0	14	24.0		
Diastole (post)						
Normal	14	28.0	2	4.0	22.61	<0.001
Mild	27	54.0	20	40.0		
Moderate	9	18.0	19	38.0		
High	0	0.0	9	18.0		
Diastole (follow-up)						
Normal	42	84.0	4	8.0	62.21	<0.001
Mild	8	16.0	21	42.0		
Moderate	0	0.0	19	38.0		
High	0	0.0	6	12.0		

Table (5): pain (pre, post and follow intervention) among study and control group

	Groups				Test	P-Value
	Study (N=50)		Controls (N=50)			
	No	%	No	%		
Pain pre						
Mild	13	26.0	2	4.0	χ^2 9.49	0.002
Moderate	37	74.0	48	96.0		
Pain post						
No pain	6	12.0	0	0.0	χ^2 69.49	<0.001
Mild	35	70.0	0	0.0		
Moderate	9	18.0	50	100.0		
Pain follow-up						
No pain	45	90.0	0	0.0	χ^2 83.84	<0.001
Mild	5	10.0	21	42.0		
Moderate	0	0.0	29	58.0		
Pain						
Pre	10.02±2.36		10.28±1.73		t=0.62	0.533
Post	5.18±2.32		9.92±1.27		MW=8.14	<0.001
Follow-up	1.58±0.85		8.02±1.65		MW=8.73	<0.001

Table (6): Anxiety (pre, post and follow intervention) among study and control group

	Groups				Test	P-Value
	Study (N=50)		Controls (N=50)			
	No	%	No	%		
Anxiety pre					χ^2 1.39	0.708
Mild	2	4.0	1	2.0		
Moderate	20	40.0	23	46.0		
Severe	25	50.0	21	42.0		
Very severe	3	6.0	5	10.0		
Anxiety post					χ^2 33.71	<0.001
No	2	4.0	0	0.0		
Mild	21	42.0	1	2.0		
Moderate	25	50.0	31	62.0		
Severe	2	4.0	16	32.0		
Very severe	0	0.0	2	4.0		
Anxiety follow-up					χ^2 81.50	<0.001
No	25	50.0	0	0.0		
Mild	22	44.0	2	4.0		
Moderate	3	6.0	40	80.0		
Severe	0	0.0	8	16.0		
Anxiety						
Pre	24.70±3.51		24.54±3.89		t=0.21	0.830
Post	17.42±2.37		23.68±3.48		t=10.49	<0.001
Follow-up	13.66±2.23		22.18±2.77		t=16.90	<0.001

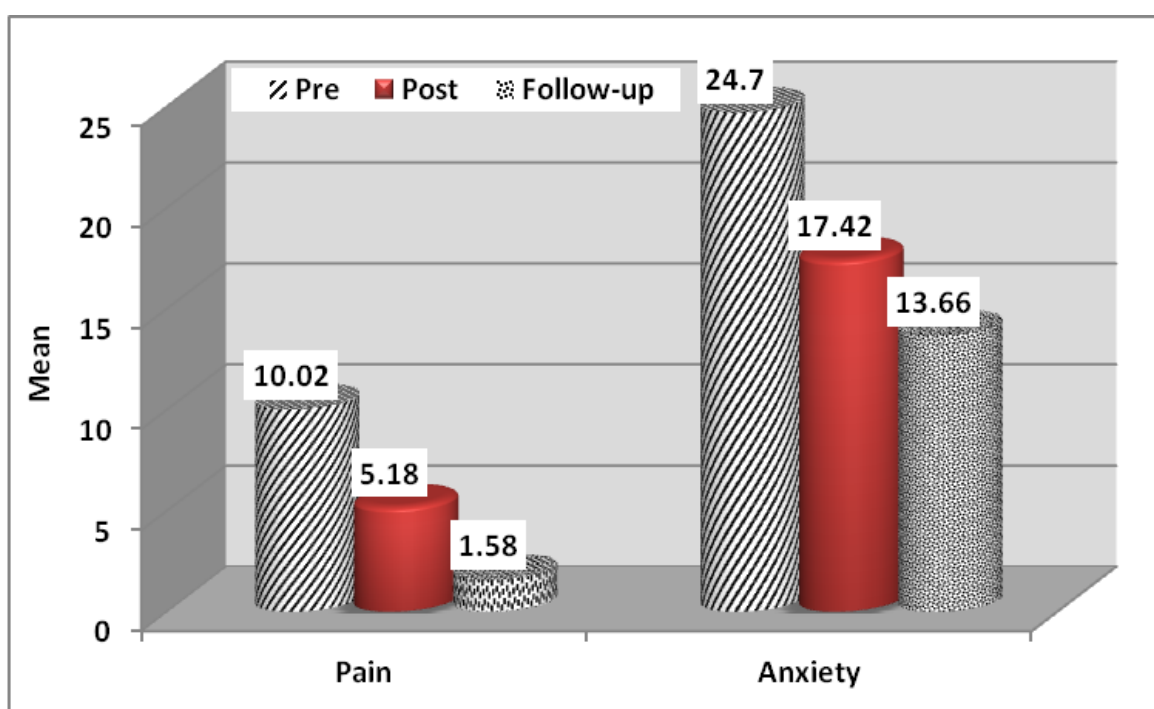


Fig 1: Pain and anxiety score among the studied group(Pre –post-follow-up)

Table 7: Relation between Total pain score and Socio-demographic data:

	Pain score					
	Pre		Post		Follow-up	
	Mean ±SD	Test P value	Mean ±SD	Test P value	Mean ±SD	Test P value
Age (Y)						
40-60	9.62 ±2.28	t=0.14	5.07 ±2.31	Mann-Whitney =0.51	1.55 ±0.84	Mann-Whitney =1.92
>60	10.47 ±2.42	P=0.891	5.30 ±2.38	P=0.608	1.60±0.89	P=0.054
Sex :						
Male	10.04 ±2.17	t=1.27	5.07 ±2.02	Mann-Whitney =0.21	1.70±0.78	Mann-Whitney =0.17
Female	9.88 ±3.25	P=0.210	5.66±3.50	P=0.828	1.0±1.0	P=0.865
Marital status :						
Single	7.0 ±0.0	F=14.41	3.0 ±0.0	Kruska-Wallis =10.67	1.0 ±1.41	Kruska-Wallis =15.07
Married	10.84 ±1.81	<0.001	5.74 ±2.11	P=0.014	1.84 ±0.58	P=0.002
Divorced	6.0 ±0.0		2.50 ±0.57		0.25 ±0.50	
Widow	8.66 ±2.88		4.33±4.04		0.66 ±1.15	
Education :						
Illiterate	9.41±1.88		4.58 ±2.64	Kruska-Wallis =4.82	1.58 ±0.51	Kruska-Wallis =1.16
Read and write	11.62 ±1.06	F=1.05	6.50 ±1.06	P=0.089	1.87 ±0.35	P=0.558
Secondary	10.0 ±2.31	P=0.378	4.90 ±1.71		1.75 ±1.01	
High	9.50 ±3.30		5.40 ±3.40		1.0 ±0.94	
Occupation :						
Unskilled	9.07 ±1.26		4.0 ±2.03	Kruska-Wallis =7.06	18.20 ±4.52	F=5.84
Skilled	11.90±0.99	F=9.92	6.60 ±1.17	P=0.133	1.64 ±0.74	P=0.211
Administrative	9.33 ±2.87	P=0.031	4.75±2.0		2.0±0.47	
Housewife	9.88 ±3.25		5.66 ±3.50		1.0 ±1.0	
Not working	10.80 ±1.78		5.80 ±1.64		1.80 ±0.44	
Smoking:						
Yes	9.91 ±2.15	Mann-Whitney =0.75	5.11 ±2.13	Mann-Whitney =0.09	1.63 ±0.76	Mann-Whitney =0.54
No	10.28 ±2.92	P=0.451	5.35 ±2.84	P=0.921	1.42 ±1.08	P=0.588

Table 8: Relation between Total anxiety score and Socio-demographic data:

	Anxiety score					
	Pre		Post		Follow-up	
	Mean ±SD	Test P value	Mean ±SD	Test P value	Mean ±SD	Test P value
Age (Y)						
40-60	24.29 ±4.12	t=0.87	16.85 ±2.76	t=1.88	13.11 ±1.78	t=1.93
>60	25.17 ±2.65	P=0.385	18.08 ±1.62	P=0.066	14.30 ±2.56	P=0.059
Sex :						
Male	24.07 ±3.28	t=2.88	17.07 ±2.43	t=3.45	13.63 ±2.05	t=0.13
Female	27.55 ±3.28	P=0.006	19.0 ±1.22	P=0.002	13.77 ±3.07	P=0.896
Marital status :						
Single	26.0 ±0.81	F=6.94	15.50 ±0.57	F=1.95	12.50 ±1.29	F=4.09
Married	23.79 ±3.27	P=0.001	17.38 ±2.47	P=0.133	14.15 ±2.15	P=0.012
Divorced	27.50 ±1.29		18.0 ±0.81		10.75 ±0.95	
Widow	31.0 ±1.0		19.66±2.08		12.66 ±2.08	
Education :						
Illiterate	22.75 ±1.28		16.16 ±1.52		12.75 ±1.05	
Read and write	26.37 ±2.87	F=5.52	19.25 ±3.10	F=6.02	14.62 ±2.32	F=1.27
Secondary	23.80 ±3.84	P=0.002	16.70 ±2.20	P=0.002	13.90 ±2.22	P=0.295
High	27.50 ±3.10		18.90 ±1.19		13.50 ±3.02	
Occupation :						
Unskilled	23.71±3.09		16.50 ±2.21		12.85 ±1.35	
Skilled	25.0±3.62	F=3.68	18.50 ±3.02	F=3.58	14.70 ±2.71	F=1.07
Administrative	24.91 ±1.78	P=0.011	17.25±1.60	P=0.013	13.83±2.12	P=0.380
Housewife	27.55 ±3.28		19.0 ±1.22		13.77 ±3.07	
Not working	21.20 ±6.34		15.40 ±2.40		13.20 ±1.48	
Smoking:						
Yes	23.86 ±3.29	Mann-Whitney =2.59	17.05 ±2.55	Mann-Whitney =2.03	13.63 ±2.07	Mann-Whitney =0.03
No	26.85 ±3.23	P=0.009	18.35 ±1.54	P=0.042	13.71 ±2.70	P=0.974

Table (9): Pearson correlation between pain and anxiety scores:

Anxiety	Pain					
	Pre		Post		Follow-up	
	R	P value	r	P value	r	P value
Pre	0.10	0.491	-	-	-	-
Post	-	-	0.37	0.009	-	-
Follow-up	-	-	-	-	0.68	<0.001

5. DISCUSSION

Today, massage has become an important part of physical therapy treatment. Massage therapy is the most popular among stroke patients. It helps the muscles stimulate blood flow and consequently improved overall mobility that helped the patients to decrease level of pain and anxiety.

Regarding to Socio demographic data, the present study showed that more than half of study and control group ranged from 40- 60 years and most of them were male and married. This showed that stroke incidence rises exponentially with increasing age. Also one third of the study group and two third of control group were low education. Most of the study and control group were administrative work. These findings interpreted that low patient income was common cause of stroke. These results supported by **Mahmudur et al., (2013)** that found out of 100 patients 29% were in between 51- 60 years age group & 72% were male and 28% were female patients. In this series 24% were illiterate. Of the literate group 39% went to primary school, 20% completed graduation and only 4% completed post-graduation. Majority of the patients were unemployed (22%). Other was businessman (23%), housewife (19%) and cultivator (16%). 63% percentage of the patients from low income group, which was followed by middle income group (33%). High majority of the study and control group were smoked. Also this finding is supported by **Lip GY, Frison, Halperin, Lane, (2010) and Juliet , (2012)** they found that most study group that libeled to stroke were smoker. These result means smokings are the most common causes of stroke. Also there is less available evidence of an association between socioeconomic status and stroke

Regarding to distribution of patients according to their condition, The results of the current study revealed that the majority of the study group were ischemic stroke and had semi conscious level. Also the majority of the study group suffered from hemiplegia and pain in all muscles of body. On the same line **Mahmudur et al., (2013)** found that Majority of the study sample (53% patients) had Ischaemic stroke. These results supported by **Louis, (2014)** who found that in both types of stroke, one or more areas of the brain can be damaged. Depending upon the area affected, the patients lose the ability to move one side of the body, the ability to speak, or a number of other functions. **Fawi et al., (2009)** were found at 30.5% for hemorrhage and 69.5% for ischemic

Regarding to Pulse and blood pressure (pre, post and follow intervention) the current study revealed that more than two thirds of study group were suffering from tachycardia before intervention. While the patient's numbers decrease about two thirds in post intervention and improving patients by absent of tachycardia among study group in follow up intervention. Also the present study found that there were no statistical significance differences in pre intervention, while there were statistical significances in post and follow up intervention. Moreover, the results of the current study indicated that the whole body massage therapy reduces systolic blood pressure that approximately half of study group were suffering from increase in systole and diastolic pressure in pre intervention while in post intervention improving patients from moderate to mild blood pressure, in follow up the majority of study group had normal systolic and diastolic blood pressure. Similar findings were reported by **Mohsen et al., (2012)** who found that Massage therapy to the patients' stroke, decreased systolic blood pressure, pulse and respiration rates of patients. On the same line **Melodee and Kathy (2010)** found that back massage and hand massage showed statistically significant improvements on physiological or psychological indicators of relaxation. This means decrease blood pressure and heart rate by massage.

Brennan, & DeBate, (2006). The results of this analysis showed a statistical significance for systolic blood pressure level for Group three for the one week post intervention measurement. Also **Huzurevinde et al., (2007)** found that before applying massage, the vital signs of Patient were investigated, there was no a significant difference in respiratory rate, pulse and blood pressure, while there was a significant difference among systolic and diastolic blood pressure and heart rate values in post and follow up intervention. **Golia (2005)** was fond that massage effectively decreased systolic BP and heart rate immediately and for up to twenty minutes after the massage. **Esther and chin (2004)** they revealed that the massage intervention on all physiological measures (systolic and diastolic blood pressures and heart rate) changed positively, indicating relaxation and reflected by the maintenance of the psycho-physiological parameters after the massage. these findings interpreted that massage therapy promoting relaxation of the body that decreased blood pressure and heart rate.

Regarding to pain (pre, post and follow intervention) the present study results showed that more than half of the study group were suffering from pain in pre intervention, while in post intervention more than half of study group were had mild pain , in follow up the majority of study group had not pain. Also the present study found that there were no

statistical significance differences in pre intervention, while there were statistical significances in post and follow up intervention. Similar findings were reported by **Mok (2009)**. He revealed that massage intervention significantly reduced the patients' levels of pain. **Lexington, (2015)** revealed that subjects in the massage group had significantly lower pain, anxiety, blood pressure and heart rate, compared to subjects in the control group. Three days after the massage had ended; these improvements were maintained among the massage recipients.

Rose Adams, (2010) also concerning the effects of massage therapy on overall pain level, emotional well-being, ability to move, ability to participate in therapies, relaxation after massage, ability to sleep, contribution to faster recovery, and less need for pain medication after massage. Participants were asked if there was improvement, no change, or a worsening in the foregoing factors because of the massage. In all areas surveyed, a majority of participants reported an improvement.

Regarding to anxiety (pre, post and follow intervention) the current study showed that half of study group were had severe anxiety in pre intervention, but in post intervention half of study group were had mild anxiety, in follow up intervention half of the study group had no anxiety. Also the present study interpreted that there were no statistical significance differences in pre intervention, while there were statistical significances in post and follow up according to anxiety level. **Mok and Woo (2009)** revealed that the massage intervention significantly reduced the patients' levels of pain perception and anxiety. Similar findings were reported by **Bazrafshan and Ghorbani (2010)**. He revealed that the anxiety level were 51 ± 6.6 and 49.90 ± 6.6 at baseline in the intervention and control groups, respectively ($P=0.460$). After the intervention, the means of anxiety level were decrease post intervention. This means anxiety level decrease in post intervention than pre intervention. **Zinatet al., (2012)** reported that there was also a statistically significant decrease in level of anxiety after the back massage. **So Concerning Pain and anxiety score among the study group of the current study** showed that improvement in pain and anxiety in post and follow up intervention than pre intervention.

So Results of this study showed that massage had significantly reduced pain, anxiety, blood pressure and heart rate, as compared to subjects in the control group.

Regarding to Relation between total pain score and Socio-demographic data: the present study demonstrated that there were high statistical significance relation between marital status and pain in pre intervention and follow up intervention. These findings interpreted that any change in the marital status could be affected on pain sensation. **Wenig et al (2009)** found that age, education and marital status affect on the pain. **Michèle et al., (2012)** showed that cerebrovascular disease patient was associated with gender, occupation, and impaired memory function. It correlated with feelings, sleep, emotion, cognition, and pain issues.

According to correlation between total anxiety score and socio-demographic data: the current study showed that most of study sample were no statistical significance in relation to socio-demographic data and anxiety level. This may be due to the small sample size as well as the total population of stroke. While there was statistical significance in relation to sex and marital status and anxiety level in pre intervention, also there was statistical significance in relation to education and anxiety level in pre and post intervention. This means that socio-demographic characteristics had not affect on level of anxiety except marital status and education. **Barbour and Mead (2012)** they found that anxiety was associated with stroke severity although the association was not significant in non depressed patients. Did not find this relationship between anxiety and socio-demographic.

Cheng-Fang , (2013) emphasis that relation between family adversity and social anxiety, as well as the mediating effects of family function was revealed that all three indicators of family adversity reduced the level of family function, that decreased family function compromised the level of self-esteem, and that a low level of self-esteem further increased the severity of anxiety. These findings were agreement with **Noori and Janet Landeen (2007)** they found that

The rate of anxiety is different among individuals according to divorced individuals, not married individuals.

Regarding to correlation between pain and anxiety scores: the current study showed that positive correlation between pain and anxiety level in follow up intervention. Similar findings were reported by **Sang and Eun (2013)** they found at the baseline parameters did not show significant differences between two groups. After intervention, both groups revealed significant improvement in anxiety levels, as well as in pain. However, the improvement on pain ($p=0.002$) and anxiety ($p=0.010$) was significantly greater in the study group.

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(Jonsson et al. 2006) found that bodily pain in the acute phase had a significant effect on anxiety and follow-up. Also study found 32% of patients experienced pain four months after stroke, while 48% of the patients with pain reported disturbed anxiety. Our findings suggest that pain and disturbed anxiety in the acute phase may impair rehabilitation of to six months post-stroke.

Also Rose Adams, (2010) showed that the interrelatedness of themes becomes apparent in how patient and nursing comments alike reflect the connection between emotional well-being and relaxation, pain relief, and ability to sleep. Participants mentioned emotional well-being 8 times in connection with decreased anxiety, state of mind, attitude improvement.

6. CONCLUSION

The current study concluded that improvement of pain and anxiety in post intervention and follow up than pre intervention. Also there were statistical significances in post and follow up according to anxiety level and pain. Also there were statistically significant improvements on blood pressure and heart rate by massage post and follow up intervention than pre intervention. The current study showed that positive correlation between pain and anxiety level in follow up intervention.

7. RECOMMENDATIONS

Based on the findings of the current study, the following recommendations can be suggested:

- 1- The investigator recommends implementation of massage and other alternative methods in the treatment of pain and anxiety among stroke patients.
- 2- Educate nursing about how Implementation of massage therapy among stroke patients.
- 3- Replication of the study with larger probability sample must be considered in the development of future research to allow greater generalization of the results.

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