

Positioning and Early Mobilization: Effect of Educational Guidelines on Nurses' performance and Stroke Patients' Outcome

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Abstract: Keeping the immobilized patient after stroke in the proper positions in bed and early mobilization remain important issues in a nursing care which are likely to lead to better patients' outcomes. **Aims:** The aim of this study was to assess and evaluate the effect of educational guidelines intervention regarding positioning and early mobilization on nurses' performance and stroke patients' outcome. **Subjects and Methods:** **Design:** A quasi experimental design was used. **Setting:** The study was conducted in Neurocritical Intensive Care Unit, Stroke Unit and General Intensive Care Unit at Bab Elsheria Hospital. **Sample:** A purposive sample of 50 nurses and two purposive samples of stroke patients (25 patients were taken pre-guidelines intervention and 25 patients were post-guidelines intervention). **Tools for data collection:** A Self-administered structured Questionnaire, observational checklist and Patient assessment sheet. **Results:** There was a statistically significance differences between pre & post guidelines intervention regarding knowledge, practice and attitude of the studied nurses regarding positioning and early mobilization of stroke patients. While, there was no statistically significant difference between pre & post guidelines implementation regarding the stroke patients' outcome. **Conclusions:** Educational guidelines were helpful on the improvement of the nurses' knowledge, practice and attitude regarding positioning and early mobilization of stroke patients. **Recommendations:** Periodic in service – training programs regarding positioning and early mobilization of stroke patients based on best practice guidelines for nurses caring for the stroke patients. [Naglaa Elsayed Mahdy, Yosreah Mohamed Mohamed, and Lobna Mohamed Abu Nagm. **Positioning and Early Mobilization: Effect of Educational Guidelines on Nurses' performance and Stroke Patients' Outcome.** *J Am Sci* 2016;12(8):131-146]. ISSN 1545-1003 (print); ISSN 2375-7264 (online). <http://www.jofamericanscience.org>. 18. doi:[10.7537/marsjas120816.18](https://doi.org/10.7537/marsjas120816.18).

Key words: Guidelines, positioning, early mobilization, stroke and outcome.

1. Introduction:

A stroke is an injury to the brain that has effects that extend far beyond the health of the individual. Stroke triggers a cascade of life-changing events that affect the stroke survivor, the family, and the community. Also, Cerebrovascular Stroke (CVS) is a sudden or gradual interruption of blood supply to a vital center in the brain, and indicates infarction rather than ischemia. The CVS are classified as ischemic or hemorrhagic which may cause complete or partial paralysis or death (Burns, 2014; Hinkle & Cheever, 2014).

More than 70% of cerebrovascular stroke survivors are unable to return fully to their prior occupations, in addition, patients may have longer periods of disability before death with significant costs for individuals and society. One quarter of all CVS is fatal and when not fatal, it is often disabling (Denny, 2011; White et al., 2013). Every year, 16 million people worldwide suffer a stroke. Nearly six million die and another five million are left permanently disabled. Stroke is the second leading cause of disability, after dementia. Disability may include loss of vision and / or speech, paralysis and confusion. CVS is the third cause of death among adult Americans. Each year, approximately 795,000

Americans have a new or recurrent stroke (Thom et al., 2011 and World Heart Federation, 2015).

Cerebrovascular stroke is two types of stroke: ischemic stroke occurs due to a lack of oxygen supply to the brain caused by a blockage in normal brain perfusion, Hemorrhagic stroke is caused by bleeding from a burst blood vessel. Both forms of stroke have a detrimental effect on healthy brain tissue as a result of a decrease of healthy cerebrovascular functioning. Ischemic stroke is the most prevalent among patient populations by far, consisting of approximately 87% of all strokes (American Heart Association, 2014)

After a stroke, muscles can be affected in various ways, causing pain, spasticity, and problems with range of motion. One way to minimize these effects is to properly support, position and align body. While in the hospital, healthcare professional will suggest ways to position body of patient with stroke that are safe and comfortable. This may include the proper techniques when positioning patient in bed, transferring from sitting to standing or using devices such as foam wedges or slings to maintain support (Timby & Smith, 2014).

Stroke unit care, providing early rehabilitation, improves long-term outcomes for patients following a stroke. Early mobilization and good positioning are

now recognized as key aspects and important features of such care in the stroke unit. Patients should be given individualized positioning and early mobilization management plans as soon as possible after a stroke to prevent complications and to regain function. Studies have shown that hospital units that specialize in stroke care decrease mortality, increase the likelihood of patients being discharged to their homes and improve functional status and quality of life (*Jouria & Katz, 2010 and Langhorne et al., 2010*)

After a stroke, patient may have less ability to move certain parts of the body as a result of the problems with the arm and leg on one side of the body as hemiplegia or hemiparesis. This can lead to a number of problems such as: pressure sores, chest infections, blood clots in the legs, blood clots that travel to the lungs (pulmonary embolism), urinary tract infections, constipation, less range of motion in a joint, permanent muscle shortening (contracture), partial separation of shoulder joint, muscle shrinkage, blood pressure problems, swelling, chronic pain in an affected limb, muscle spasticity and psychological problems (*Kilbride & Kneafsey, 2010 and Askim et al., 2012*).

Following a stroke, patients often used to spend the first days of admission in bed, which put them at high risk of developing complications caused by immobility. It is now widely recommended that those who have had an acute stroke, when their clinical condition permits, should be helped to sit up and mobilize as soon as possible. People with acute strokes should be assisted to sit up as soon as possible in line with correct handling (when their condition permits). When lying or sitting, patients should be optimally positioned so as to minimize the risk of complications such as aspiration, shoulder pain, contractures, swelling of the extremities and skin pressure ulceration (*Indredavik, 2009 and Askim et al, 2012*)

Patient's positioning is an essential aspect of nursing practice and defined as the achievement of optimal, appropriate body alignment. Maintaining good body alignment, changing positioning regularly and systematically are essential principles of patient's positioning that nurses must consider to promote patient's physiological and/or psychological well-being and reducing the risk of discomfort and complication. Good positioning after a stroke can help treat problems with the affected arm and leg. It can also help prevent new problems from developing. In all cases, proper positioning helps prevent more harm to affected limbs. Good positioning also helps prevent future pain and helps maintain the normal range of motion (*Jouria and Katz, 2013*)

'Early' mobilization takes place within the first week after a stroke while 'very early' mobilization takes place within the first 24 hours (*Bernhardt,*

2008). In the first 24 hours, patients often have problems such as reduced levels of consciousness and awareness, weakness and/or reduced coordination of one or more limbs, and sensory and visual loss. These symptoms may make it difficult, and in some cases unsafe, to get out of bed. However, it is thought that the benefits of early mobilization, when patients' clinical condition allows, are greater than the risks when it is delivered by appropriately trained staff on a stroke unit. Early mobilization can be defined as —the act of getting a patient to move in the bed, sit up, stand, sitting in a chair and eventually walk (*Skarin, 2011*).

Nurses working on stroke units have an important role because they are able to implement positioning and early mobilization strategies 24 hours a day, reducing the risk of complications and improving functional recovery. Patients benefit if nurses implement effectively positioning and early mobilization. It is essential that the nursing staff have the training and competence to ensure safe comfortable positioning and early mobilization for their patients. Nurses who develop expert skills by working as part of an integrated stroke team play a crucial role in improving patients' outcomes. By applying individualized positioning and early mobilization management plans, and by using appropriate equipment, nurses can improve survival, promote patients' functional recovery and reduce the risk of secondary complications (*Keating et al., 2012*).

Significance & justification

Worldwide CVS is the second leading cause of death for people above the age of 60, and the fifth leading cause of death in people aged 15 to 59 years old. Each year about 700,000 people experience a new or recurrent stroke (*World Heart Federation, 2015*). Stroke death in Egypt reached 14.37% of total deaths; the age-adjusted death rate is 110.45/100,000, ranking Egypt high in the world the disabilities as a result of stroke. Its incidence rate in Upper Egypt was 1.8/1000 (*Ali, 2013*). According to *Bab Elsheria hospital statistical department, 2014*, the numbers of patients diagnosed with stroke were 420 in the year.

There is a little evidence, that consistently positioning stroke patients is therapeutic and will enhance functional recovery. Proper positioning post-stroke is essential in order to reduce the risk of shoulder subluxation, contractures and pain. Proper positioning may also enhance motor recovery, range of motion, and oxygen saturation. Nurses work as part of an integrated stroke team has essential role in improving patient outcomes. The nursing staff, therefore, needs to know and implement these postures and understand their potential underlying value. Nurses and care staff should be given training on how to position patients who cannot position themselves

after stroke. Visual and written information, individualized to the patient, should be made available to staff concerning optimal positioning and early mobilization. Also, it is important to examine nurses' knowledge, practice and attitude regarding positioning and early mobilization of stroke patients before and after an educational intervention.

Aim:

The aim of this study was to assess and evaluate the effect of educational guidelines intervention regarding positioning and early mobilization on nurses' performance and stroke patients' outcome. This has been achieved through the following specific objectives:

1. Assess the nurses' performance (knowledge, practice and attitude) regarding positioning and early mobilization of the stroke patients.
2. Design and implement the educational guidelines regarding positioning and early mobilization of the stroke patients.
3. Evaluate the effect of educational guidelines intervention on nurses' performance (knowledge, practice and attitude) regarding positioning and early mobilization of stroke patients.
4. Evaluate the effect of educational guidelines intervention on stroke patients' outcome

Operational definition:

Patient's positioning: is the achievement of optimal and appropriate body alignment in bed or in chair to reduce the risk of patients' discomfort and complications.

Early mobilization can be defined as —the act of getting a patient to move in the bed, encourage and assist patient to do range of motion exercises for affected and non affected area of the body, sit up, sitting in a chair. People with acute stroke should be mobilized as soon as possible when their clinical condition permits.

Nurses' performance: It involved nurses' knowledge, practice and attitude regarding positioning and early mobilization of stroke patients as is an important aspect in nurse's role.

Stroke patients' outcome: A number of problems or complications that may be occurred due to poor patients' positioning and a delay in stroke patients' mobilization such as: pressure sores, less range of motion in a joint, permanent muscle shortening (contracture), arm swelling and pain in an affected limb and etc.

Hypothesis:

1- There is a statistically significance differences between pre & post educational guidelines intervention regarding the studied nurses' performance (knowledge, practice and attitude) regarding positioning and early mobilization for the stroke patients.

2- There is a statistically significant difference between pre & post educational guidelines intervention regarding the stroke patients' outcome.

Subjects and Methods

Research design

A quasi experimental study design was utilized to accomplish this study.

Settings

The study was conducted in Neurocritical Intensive Care Unit, Stroke Unit and General Intensive Care Unit at Bab Elsheria Hospital.

Subjects

1- A purposive sample of nurses was taken from the previously mentioned study settings. The total number was 50 nurses were included in the study, whereas 22 nurses from Neurocritical Intensive Care Unit, 10 nurses from the Stroke Unit and 18 nurses from General Intensive Care Unit were included in this study were at different age, different educational levels and had minimally 3 years of experience and who caring for immobilized stroke patients and willing to participate in the study.

2- Two purposive samples of stroke patients with functional disability as hemiplegia or hemiparesis due to stroke and free from other complications associated with immobility were taken from the previously mentioned study settings. The first sample was taken pre-guidelines intervention and its number was 25 patients. The second sample was taken post-guidelines intervention and its number was 25 patients. Patients were included in this study were from both gender, with different age, non---psychiatric and willing to participate in the study.

Tools for data collection

Three different tools were used to collect data pertinent for this study. They included the following:

1- A Self-Administered Structured Questionnaire:

It was written in a simple Arabic language and comprises four parts. It was developed by the researchers based on the related literature (*Christensen & Kockrow, 2011; Potter and Perry, 2013; White et al., 2013; Lewis et al., 2014 and Burton & Ludwig, 2015*) and validated by a group of five experts in medical surgical nursing department at Faculty of Nursing, Ain Shams University. **The first part** was concerned with assessment of demographic characteristics of the studied nurses such as age, gender, qualification, years of experience, and attendance of the related training courses. **The second part:** It was used to assess nurses' level of knowledge regarding what is positioning recommended for stroke patient? why is positioning important after a stroke? How effective is positioning after stroke? what devices can be used for positioning? Are there any side effects/risks? what are complications of poor

positioning?, what are the nurses' role in prevention of complications of poor positioning?, The benefits of early mobilization and range of motion exercises. **The third part:** It was used to assess the nurses' level of attitude regarding their role for keeping proper positioning and early mobilization by using Attitude Likert scale. **The fourth part** was used to assess the available and unavailable recourses that help for keeping proper patient's positioning and early mobilization of stroke patient.

Scoring systems

Regarding to the 2nd part:

The total score of knowledge was 70 degrees. The score one was given for each correct answer and zero for incorrect answer. For each area of knowledge, the scores of the items were summed-up and the total score divided by the number of the items. These scores were converted into a percent score. The total nurses' knowledge was considered satisfactory if the percent score was 75% or more, and unsatisfactory if less than 75%.

Regarding to the 3rd part:

The total score of attitude was 20 grades. Each correct answer was given one grade and the incorrect answer was given zero.

It was considered as follows

- $\geq 75\%$ = positive attitude when the total marks $= \geq 15$ marks
- $< 75\%$ = negative attitude when the total marks $= < 15$ marks.

II- Performance observational checklist:

The observational checklist was developed and constructed by the researchers based on the related literature (Potter and Perry, 2013; Williams and Dewitt, 2014 and Burton & Ludwig, 2015) and validated by a group of five experts in medical surgical nursing department at Faculty of Nursing, Ain Shams University. An observational checklist was designed to assess nurses' level of practices regarding positioning and early mobilization of the stroke patients including nurses' practice in keeping patient on affected side, keeping patient on unaffected side, keeping patient on back, keeping patient sitting in bed, sitting up and keeping patient sitting in chair and range of motion exercises.

The scoring system

The total score of practice was 80 degrees. The item observed to be done correctly were scored "1" and the item not done or incorrectly done was scored "0". For each procedure, the scores of the items were summed - up and the total divided by the number of the items. These scores were converted into a percent score. The practice was considered satisfactory if the percent score was 75% or more of the sum of the total practice score, and unsatisfactory if less than 75%.

III. Patient's assessment sheet:

It was developed by the researchers and written in English language based on the related literature (Coope and Gosnell, 2015; Lewis et al. 2014; Williams and Dewitt, 2014). It was also validated by a group of five experts in medical surgical nursing department at Faculty of Nursing, Ain Shams University. It comprises three parts. **The first part:** It was concerned with characteristics of the studied patients such as age, gender, diagnosis, types of disability, length of hospital stay and cause of immobilization. **The second part:** It was concerned with assessment for some complications associated with poor patient's positioning and late mobilization such as: pressure sores, chest infection, deep venous thrombosis, less range of motion, permanent muscle shortening (contracture), shoulder pain in the affected side, swelling in the affected limb, partial separation of shoulder joint, foot drop and spine deformity, muscle spasticity and Psychological problems (depression). The severity of complications was evaluated by the using five point likert scale that was adopted from (Pérez-Mármol, et al., 2015). The Psychological problems (depression) were evaluated by the using The Hospital Anxiety and Depression Scale (HADS) adopted from Zigmond and Snaith (1983) to assess depression in a stroke patient. It has 2 subscales: depression and anxiety, both with 7 items. It has accepted reliability with internal consistency of the Depression subscale of the HADS is adequate to excellent (Cronbach's $\alpha = 0.79$ --- 0.8122) and accepted validity: Correlation of the Depression subscale of the HADS is adequate with (Pearson's $r = -0.58$) (Berry & Kennedy, 2003; Woolrich et al., 2006 and Elfstrom et al., 2007).

The scoring system

The severity of complications:

Five point Likert scale ranging from 0 "not at all" to 4 "very much" was used to assess the severity for some complications such as: less range of motion in a joint, permanent muscle shortening (contracture), arm swelling and pain in an affected limb.

The Psychological problems (depression) was evaluated by the using The Hospital Anxiety and Depression Scale (HADS), Responses are based on the relative frequency of symptoms over the past week, using a four point Likert scale ranging from 0 (not at all) to 3 (very often indeed). Total score: Scoring: Responses are summed to provide separate scores for anxiety and depression symptomology; each of anxiety or depression scale have a score range of 0--21. It was considered that: Depression 0-7 = Normal, 8-10 = Borderline abnormal (borderline case), 11-21 = Abnormal (case).

Educational guidelines:

Educational guidelines were designed by the researchers based on the needs of the studied nurses to improve their knowledge, practice and attitude regarding positioning and early mobilization of the stroke patients based on the related literature (Smeltzers, Bare, Hinkle, and Cheever, 2013; Williams and Dewitt, 2014 and Burton & Ludwig, 2015). It was written in Arabic language. The guidelines were revised by a group of five experts in Medical Surgical Nursing at faculty of Nursing, Ain Shams University for the content validity and applicability. It included two parts as the following: **Part I- Theoretical part;** it covered the following items; knowledge regarding stroke (as definition, causes, types, risk factors, signs & symptoms and complications), knowledge regarding positioning (as What is positioning?, importance of proper positioning after a stroke, Some common positions recommended following a stroke, How effective is positioning after stroke, and the devices can be used for positioning?), and knowledge regarding the benefits of early mobilization, range of motion exercises, and the side effects/risks resulting from improper positioning and late patient's mobilization. **II- Practical part;** it was concerned with the nurses' practices regarding positioning and early mobilization of the stroke patient such as in keeping patient on an affected side, on unaffected side, on back, sitting in bed, sitting up, sitting in chair and range of motion exercises.

2-Operational Design:

It includes preparatory phase, content validity and reliability, pilot study and field work.

A. The preparatory Phase:

It included reviewing of related literature, and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop data collection tools, the educational guidelines content and media.

B. Validity and Reliability

Testing validity of the proposed tools by inspecting the items to determine whether the tools measure what supposed to measure. The stage developed by a jury of 5experts from different academic categories (professors and assistant professors) of the medical – surgical nursing at the faculty of nursing, Ain Shams University. The expertise reviewed the tools for clarity, relevance, comprehensiveness, simplicity and minor modification was done. **Testing reliability** of the proposed tools was done statistically by Crombach alpha test.

Ethical consideration:

The aim of the research was explained to the participants. Verbal consent was obtained from each nurse and patient to ensure their acceptance to participate in the study, after clarifying the procedures of the study. Participants were informed about their

right to refuse participation and to withdraw at any time without any consequences. Confidentiality of data was ensured.

C. Pilot Study:

The pilot study commenced once ethical approval had been obtained. The pilot study was conducted on 5 nurses and 5 patients to test the clarity, feasibility and applicability of the determent tools. Based on the result of the pilot study, modifications and omissions of some details were done and then the final forms were developed. The nurses and patients who included in the pilot study were excluded from the study sample.

D-Field Work:

The actual filed work of this study started at the beginning of (January 2016) and had been completely of (June 2016). This period of time was divided into:

I-Implementation phase:

Before conducting the study, an exploratory visit was done in the previously mentioned study setting in order to estimate the rate of admission and suitable time for collecting data. Personal communication was done with nurses and physician to explain the purpose of the study and gain their best possible cooperation. The researchers were available 2 days per week at the morning shift in the previously mentioned setting.

First, Patient's assessment sheet was filled out by the researchers to assess 25 stroke patients for their characteristics and some complications associated with poor patient's positioning and late mobilization. **Secondly;** the observation checklist was filled out by the researchers who were available 2 days per week alternatively in different study settings while the nurses were involved in patient care in morning shift. Then, the questionnaire format was filled in the clinical area by the studied nurses in the presence of the researchers. The assessment was done on the first four weeks for total study sample. Then, the studied nurses were divided into groups and implementation of the guidelines was carried out at the previously mentioned study settings for each group separately based on their needs. The duration of each session took approximately 1 to 1.5 hours, sessions started according to nurses' available time. Arabic language was used to suit the nurses' level of understanding. Methods of teaching used were real situations, lectures, group discussion and demonstration. An instructional media was used; it included the guidelines handout and audiovisual materials. **Finally;** Patient's assessment sheet was filled out again by the researcher post- implementation of the educational guidelines to assess another 25 stroke patients for their characteristics and some complications associated with poor patient's positioning and late mobilization.

II-Evaluation phase:

The evaluation phase was emphasized on estimating the effect of educational guidelines on nurses' performance (knowledge, practice and attitude) regarding positioning and early mobilization for the stroke patients through comparing between the results pre, and post intervention to determine the level of improvement in nurses' knowledge, practices and attitude. Also, the evaluation phase was emphasized on estimating the effect of educational guidelines on stroke patients' outcomes through comparing between the results pre, and post intervention regarding complications associated with poor patients' positioning and late mobilization.

Statistical design:

Data entry and analysis were done using the Statistical Package for Social Science (SPSS) version

10. Data were presented in the tables and charts using actual numbers and percentages. Appropriate statistical methods were applied (percentage, chi-square (X²), correlation coefficient (r) and Fisher test. Regarding P value, it was considered that: non-significant (NS) if P > 0.05, Significant (S) if P < 0.05, Highly Significant (HS) if P < 0.01.

3. Results:

Table (1): Shows socio demographic characteristics of the studied nurses, (58 %) of them, their age from 25 to 40 Years old and (46 %) their qualification was diploma nurses. Regarding their years of experience, (44 %) had experience less than 5 years. Also, all of them were female and the majority of them (82%) hadn't training courses regarding positioning and early mobilization of stroke patients respectively.

Table (1): Percentage distribution of demographic characteristics of the studied nurses.

Item	The studied nurses (n.=50)	
	No.	%
Age		
• Less Than 25 Years	24	38
• 25 to 40 Years	24	58
• Over 40 Years	2	4
Mean ± SD	± 6.4528.2	
Qualification		
• Diploma	23	46
• Technician	16	32
• Bachelor	11	22
Years of Experience		
• Less Than 5 Years	22	44
• 5 to 10 Years	15	30
• 10 to 15 Years	7	14
• More Than 15 Years	6	12
Mean ± SD	7.4 ± 5.2	
Gender		
• Female	50	100
• Male	0	0
Training course about patient's positioning		
• Yes	9	18
• No	41	82

Table (2): Shows the studied nurses' satisfactory level of knowledge in relation to theoretical background of positioning and early mobilization of stroke patients pre- & post guidelines intervention, regarding the satisfactory level of the nurses' knowledge pre – guidelines, of them had satisfactory knowledge regarding what is meant by the proper patient's positioning?, regarding the complications of improper patient's positioning and(6%) regarding how

effective is positioning after stroke? and their role regarding positioning and early mobilization of stroke patients. While post – guidelines intervention, the majority of them (90 %, had satisfactory knowledge regarding the previous items respectively. Also, there were significant differences between the studied nurses' knowledge pre- and post – guidelines intervention.

Table (2): Difference between satisfactory level of the studied nurses' knowledge in relation to theoretical background of positioning and early mobilization of the stroke patient pre- & post educational guidelines intervention.

Items	Nurses' knowledge				χ^2	P value
	Pre(n=50)		post (n=50)			
	No.	%	No.	%		
What is the proper patient's positioning?	4	8	45	90	67.27	0.00000
Importance of proper positioning after a stroke	8	16	47	94	61.45	0.00000
Common positions recommended following a stroke	10	20	48	96	59.28	0.00000
How effective is positioning after stroke?	3	6	47	94	77.44	0.00000
The devices can I use for keeping the patient in proper positioning	5	10	50	100	81.82	0.00000
The complications of improper patient's positioning	6	12	48	96	71.01	0.00000
The high risks groups for complications of improper patient's positioning	7	14	50	100	75.44	0.00000
Benefits of early mobilization	15	30	49	98	39.32	0.00000
Nurses' role regarding positioning and early mobilization of stroke patients	3	6	47	94	81.03	0.00000

Table (3) shows difference between satisfactory level of the studied nurses' practice regarding positioning of the stroke patient pre- & post- guidelines implementation. In relation to pre-guidelines intervention, 22% of them had satisfactory practice regarding lying patient on affected side, 24% regarding lying patient on unaffected side, 12% regarding lying patient on back, 16% regarding sitting patient in bed, 20% regarding sitting patient up, 22% regarding sitting patient in chair- up and 18% regarding total nurses' practice regarding positioning. While, post – guidelines intervention, the majority of them (72 %, 76 %, 68 %, 64%, 70%, 84% & 70%) had satisfactory practice regarding the previous items respectively. Also, there were significant differences between the studied nurses' practice pre- and post – guidelines intervention. The table also shows difference between satisfactory level of the studied nurses' practice regarding range of motion exercises as early mobilization of stroke patient pre- & post-guidelines implementation. In relation to pre-guidelines intervention, 22% of them had satisfactory practice regarding total range of motions exercises. While, post – guidelines intervention 76 % of them had satisfactory practice with statistically significant differences between the studied nurses' practice pre- and post – guidelines intervention.

Table (3): Difference between satisfactory level of the studied nurses' practice regarding positioning and early mobilization of the stroke patient pre- & post educational guidelines intervention.

Items	Nurses' practice				χ^2	P value
	Pre(n=50)		post (n=50)			
	No.	%	No.	%		
Lying on affected side	11	22	36	72	25.09	0.00000
Lying on unaffected side	12	24	38	76	27.04	0.00000
Lying on back	6	12	34	68	32.67	0.00000
Sitting in bed	8	16	32	64	24.00	0.00000
Sitting up	10	20	35	70	25.25	0.00000
Sitting in a chair	11	22	42	84	34.12	0.00000
Total nurses' practice regarding patient's positioning	9	18	35	70	27.44	0.00000
➤ <i>Neck exercises</i>	29	58	48	96	20.38	0.00001
➤ <i>Shoulder exercises</i>	13	26	42	84	33.98	0.0000
➤ <i>Elbow exercises</i>	31	62	46	92	12.70	0.00036
➤ <i>Wrist exercises</i>	7	14	44	88	54.78	0.0000
➤ <i>Fingers and thumb</i>	20	40	40	80	16.67	0.00004
➤ <i>Hip and knee exercises</i>	11	22	44	88	44.00	0.0000
➤ <i>Ankle exercises</i>	19	38	41	82	20.17	0.00001
➤ <i>Toes exercises</i>	15	30	38	76	21.24	0.00000
Total Range of motion (ROM)	11	22	38	76	29.17	0.00000

Table (4) reveals that, none of the studied nurses had satisfactory practice regarding Placing a pillow behind the body when lying patient on unaffected side, placing pillow beneath affected hip when lying patient on back & Sitting patient upright well supported by pillows when sitting patient in bed pre- & post guidelines intervention. However, 6% of

the studied nurses had satisfactory practice regarding Placing unaffected leg forward on a pillow when lying patient on unaffected side, 4% support legs for comfort when sitting patient in bed pre- guidelines intervention. While post-guidelines, 16% of them had satisfactory practice regarding the previous two items with no statistically significance differences. Also,

there were highly statistically significance differences (p = 0.000) regarding the rest of the items between pre- & post guidelines intervention (p =

Table (4): Common errors and neglected nurses' practice regarding stroke patients' positioning pre - and post- guidelines implementation.

Items	Satisfactory level of nurses' practice				χ^2	P value
	Pre-(n=50)		Post-(n=50)			
	No.	%	No.	%		
LYING ON AFFECTED SIDE						
Affected arm positioned comfortably flat forward straight on elbow	3	6	27	54	27.43	0.00000
Place unaffected leg forward on a pillow	2	4	8	16	4.00	0.04550
LYING ON UNAFFECTED SIDE						
Place a pillow behind the body	0	0	0	0	NA	NA
LYING ON BACK (if desired)						
Place pillow beneath affected hip	0	0	0	0	NA	NA
Ensure feet in neutral position	6	12	26	52	18.38	0.00002
SITTING IN BED						
Sit patient upright well supported by pillows	0	0	0	0	NA	NA
Place arms on pillows	10	20	27	54	22.24	0.00000
Support legs for comfort	2	4	8	16	4.00	0.04550
SITTING UP& IN CHAIR						
Keep feet flat on floor or footrests	7	14	31	61	24.45	0.00000
Keep knees directly above feet	3	6	29	58	31.07	0.00000
COMMON IN ALL NURSES' PRACTICE						
Tell the patient what you are going to do	8	16	24	48	11.76	0.00060
Make sure the patient is ready	6	12	20	40	10.19	0.00141

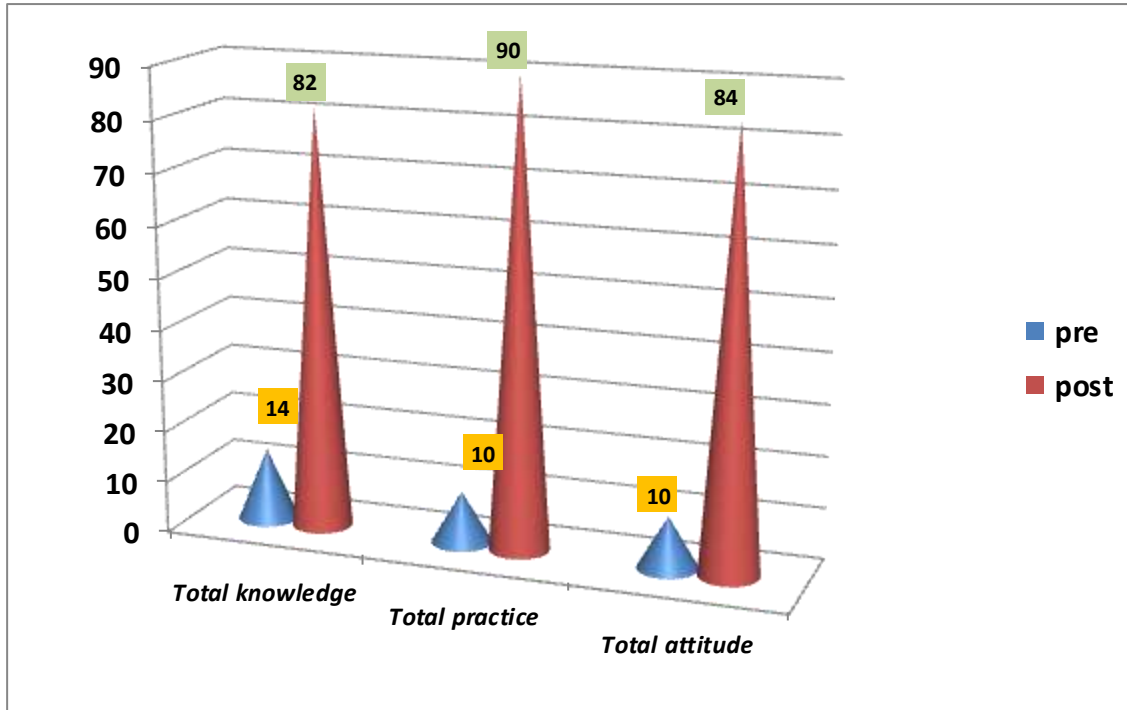


Figure (1): Difference between satisfactory level of total nurses' knowledge, practice and attitude regarding positioning and early mobilization of the stroke patient pre- post- educational guidelines intervention

Figure (1) shows difference between satisfactory level of the studied nurses' knowledge, practice and attitude regarding positioning and early mobilization of the stroke patient pre- & post- educational guidelines intervention. Pre-guidelines intervention,

14% of them had satisfactory knowledge, 10% of them had satisfactory practice and attitude. While post-educational guidelines intervention, 82% of them had satisfactory knowledge, 90% of them had satisfactory practice and 84% of them had satisfactory attitude post

guidelines intervention, with a statistically significant difference between pre – post guidelines intervention ($P = 0.000$).

Table (5) Availability of resources at the study setting that needed for proper positioning and early mobilization for stroke patients as stated by the study nurses.

Items	Availability of resources		
	Found sufficiently	Found insufficiently	Not Found
Non-human resources:			
Equipment and facilities:		100%	
Sufficient number of pillows			
Presence of support devices		100%	
Presence of adequate chairs		100%	
Presence of lift devices			100%
Policies of setting:			100%
Follow up system for early detection of complications			
Presence of positioning change assessment sheet	100%		
Documentation for complications:			100%
Human resources:			
Sufficient number of nurses		100%	
Sufficient number of Physiotherapist		100%	

Table (5) shows that, in relation to non-human resources, support devices, pillow and chairs were found insufficiently as stated by the study nurses. While, lift devices, presence of follow up system for early detection of complications and documentation were not found. Regarding number of nurses and physiotherapist as human resources was found insufficiently.

Table (6) shows characteristics of patients in the control and study group. Regarding age, 72% of the patients in the control group and 67% of the study group, their age between 50 – 60 years old. In relation to gender, 68% & 60% of patients in the control and the study group respectively were male. Concerning medical diagnosis, 84% of the patients in the control group and 76% of the study group, their diagnosis were ischemic stroke. In relation to length of hospitalization, 56% of the patients in the control group and 52% of the study group, their length of hospitalization were 5 weeks. Additionally, 72% of the patients in the control group and 64% of the study group were hemiplegic with no statistically significant difference between them concerning characteristics of patients in the study and control group.

Table (7) shows that the most common complications among patients in the control and study group were pressure sore (40% & 32% respectively), chest infection (64% & 68% respectively), moderate shoulder pain (60% & 44% respectively), muscle spasticity (60% & 48% respectively) and depression (84% & 76% respectively), with no statistically significant difference between patients in the study and control group regarding complications of improper patient's positioning and immobility.

Table (6): Difference between patients in the study and control group regarding their characteristics.

Items	Control group (25)		Study group (25)		χ^2	P value
	No	%	No	%		
Age (years):						
• 40-50	3	12	5	20	0.48	0.78803
• 50-60	18	72	19	67		
• > 60	4	16	6	24		
Gender:						
• Female	8	32	10	40	0.35	0.55569
• Male	17	68	15	60		
Diagnosis						
• Ischemic stroke	21	84	19	76	0.5	0.4795
• Haemorrhagic stroke	4	16	6	24		
Length of hospitalization						
• 4 weeks	8	32	10	40	0.46	0.7948
• 5 weeks	14	56	13	52		
• 6 weeks	3	12	2	8		
Cause of immobilization						
• Hemiplegia	18	72	16	64	0.70	0.4036
• Hemiparesis	6	24	9	36		

Table (7): Difference between patients in the study and control group regarding complications of improper patient's positioning and immobility post- educational guidelines intervention.

Items	Control group (25)		Study group (25)		χ^2	P value
	No	%	No	%		
• Pressure sores	10	40	8	32	0.35	0.55569
Chest infection	16	64	17	68	0.05	0.83158
Blood clots in the legs	3	12	3	12	0.00	1.00000
Less range of motion in joints						
- Mild	8	32	6	24	0.01	0.94026
- Moderate	5	20	4	16		
Permanent muscle shortening (contracture)						
- Mild	3	12	2	8	Fisher	0.999
- Moderate	2	8	1	4		
Shoulder Pain in the affected side						
- Mild pain	10	40	14	56	1.28	0.2575
-Moderate pain	15	60	11	44		
Swelling						
- Mild	3	12	2	8	Fisher	0.999
-Moderate	5	20	3	12		
Partial separation of shoulder joint	2	8	1	4	0.34	0.55773
Foot drop	6	24	5	20	0.10	0.74927
Spine deformity	5	20	4	16	0.12	0.72677
Muscle spasticity	15	60	12	48	0.46	0.49921
Psychological problems (depression)	21	84	19	76	0.17	0.68309

Table (8) shows that there was no statistically significant correlation between the studied nurses' knowledge and attitude regarding positioning and early mobilization of stroke patients pre- guidelines intervention. While, there were statistically significant positive correlations between total knowledge and practice pre-& post-guidelines intervention and

between total knowledge and attitude post- guidelines intervention. However, there was no statistically significant correlation between the studied nurses' practice and attitude pre- guidelines intervention, while, there was a statistically significant correlation between them post- guidelines intervention.

Table (8): Correlation between the studied nurses' knowledge with practice and attitude regarding positioning and early mobilization for stroke patients pre- & post- guideline intervention.

Items (n=50)	Nurses' Practice (n=50)		Nurses' attitude (n=50)	
	R	p- value	r	p- value
Nurses' Knowledge				
Pre	0.251	0.012	0.084	0.405
Post	0.259	0.009	0.289	0.004
Nurses' practice				
Pre	-	-	0.179	0.391
Post	-	-	0.323	0.001

4. Discussion

The CVS is the most common cause of long-term disability in adults. Early mobilization and good positioning are recognized as key aspects of care in stroke units. Nurses working on stroke units have an important role because they are able to implement positioning and early mobilization strategies 24 hours a day, reducing the risk of complications and improving functional recovery. Patients benefit if nurses work effectively with the therapy team in

positioning and early mobilization to obtain favorable patient's outcomes (White, 2015).

Knowledge and use of evidence-based practice are essential to ensure best practice. Nurses in neurological ICU must be knowledgeable of this initiative to support clinical practice toward improved outcomes of patients with CVS. A high nurses' quality performance in the neurological ICU would decrease morbidity, mortality and improve quality of care for such group of patient. Therefore, this study aimed to

evaluate the effect of educational guidelines on the nurses' performance regarding positioning and early mobilization of patients with CVS and its effect on stroke patients' outcome. (Elsayed, 2012)

Discussion of the present study findings covered five main parts: **The first part:** was concerned with demographic characteristics of the studied nurses under the study. **The second part:** was regarding the nurses' knowledge, practice and attitude differences regarding proper positioning and early mobilization of the stroke patient pre and post educational guidelines implementation, common errors and neglected nurses' practice and availability of resources. **The third part:** was regarding demographic characteristics of the patients in the study and control and patients' outcomes through monitoring complications regarding improper positioning and late mobilization. **The fourth part:** was regarding the Correlation between the studied nurses' knowledge, practice and attitude regarding positioning and early mobilization for stroke patient pre- & post guideline implementation.

Part 1:

Regarding demographic characteristics of the studied nurses, the results of the current study revealed that, the mean age were about 28 years. Regarding years of experience of the study nurses, the results of the present study showed that, less than half of them were less than five years of experience and had diploma degree, while regarding their gender, all the nurses under study were females. These results were incongruent with *Johnson, Cohn and Bakas (2011)* who found that the nurses' ages ranged from 24 to 47 years, with a mean of 33.9 years. The mean years of experience were 45 months, while the finding of this study regarding gender was the same.

As regard training courses, the majority of the nurses didn't receive training course about positioning and early mobilization of patients with CVS. This might be due to lack of in-service training programs. Also, lack of training could be due to; inadequate clinical workshops for practicing nurses regarding positioning and early mobilization of the patient with stroke, lack of funding for organizing regular workshops and the nurses' time shortage.

Regarding training, *Rudd et al., (2012)* suggested that multidisciplinary rehabilitation, staff with a specialist interest in stroke or rehabilitation should attend regular programs of staff education and training which is a key of high-quality stroke care, added to that Health care professionals should be given training on how to position patients correctly after stroke.

Regarding training also *Watkins et al., (2011)* mentioned that, for developing the expertise to provide this gold-standard care in the stroke service, nurses need specialist knowledge and skills as defined in the stroke-specific education framework, and therefore

need appropriate training and *Keating et al (2012)* emphasized that the nurses should acquire this in formal training sessions and in practice to learn safe and correct ways to move and handle individual patients. Moreover, in agreement with this *Jouria and Katz, (2013)* who stated that, nurses who care primarily for stroke patients should attend training sessions sponsored in-services, seminars and specialized lectures, three times per year. Such nurses should participate in continuing education units or other educational programs annually that are related to or focused on cerebrovascular disease.

Part 2:

Regarding Difference between satisfactory level of the studied nurses' knowledge in relation to theoretical background of positioning and early mobilization of the stroke patients pre- & post educational guidelines intervention, the current study found that, the minority of the study nurses had satisfactory knowledge regarding definition and importance of proper patient's positioning, common positions recommended following stroke, effectiveness of positioning after stroke, devices used for keeping the patient in proper positions, complications of improper patient's positioning, high risks groups for complications, benefits of early mobilization, and nurses' role regarding positioning and early mobilization of stroke patient, pre implementation of the guidelines Lack of nurses' knowledge pertinent to background of positioning and early mobilization of the patient with stroke could be due to lack of nurses' continuing training courses for nurses in their clinical practice settings, lack of protocols, and guidelines on positioning and early mobilization of the stroke patients. These results are in the same line with *Elsayed, 2012* who found that, near two third of the study nurses had unsatisfactory knowledge regarding nursing interventions and positioning of patients with CVS. Also, *Mohammed, (2012)* who found that less than one fifth of the study nurses had satisfactory knowledge regarding post-stroke complications.

While, post implementation of the guidelines, there was improvement and statistically significant difference in their knowledge regarding all the previous items. These results also were on the same line with *Damkliang et al., (2015)* who found that there were statistically significant improvements in most the areas of nurses' knowledge after implementation of an educational intervention.

In relation to difference between satisfactory level of the studied nurses' practice regarding positioning of the stroke patient pre- & post educational guidelines intervention. The results of the current study revealed that there was an improvement and a statistically significant difference in nurses'

practice regarding positioning of the patient with stroke post implementation of the educational guidelines in relation to pre implementation phase regarding all items as practicing positioning the patient lying on affected side, lying on unaffected side, sitting in bed, sitting up. This might be due to lack of continuous educational program regarding nursing management of CVS specially positioning and early mobilization, that is the first line of complications prevention, which led to lack of knowledge and consequently practice level. These results are in agreement with *Kilbride and Kneafsey, (2010)* who mentioned that the nurses when receiving adequate training, they had adequate practice to put the patient in the proper position and use standing aids and hoists to assist with mobilization soon after a stroke. Also, Nurses may give mobilizing and positioning patients a lower priority than their other nursing activities and when they change a patient's position, it may be unrelated to positional correction.

In addition, *Ledwith et al., (2010)* mentioned that positioning practices can positively or negatively affect patients and the nurses must consider potential effects of turning, evaluate changes with positioning on the basis of monitoring feedback from multimodality devices, and make independent clinical judgments about optimal positions to maintain or improve cerebral oxygenation to improve patient's outcome. So, it is very important to acquire the nurses with adequate knowledge and practice.

Regarding difference between satisfactory level of the studied nurses' practice regarding early mobilization of patient with stroke pre- & post educational guidelines intervention. According to the current study finding there was an improvement and statistically significant differences in nurses' practices regarding mobilization of patients with stroke post implementation of the educational guidelines. This improvement could be attributed to the content and process of the educational guidelines, which was individualized according to the nurses' needs. These result was in agreement with *Elsayed, (2012)* who mentioned that, with the training courses for nurses about caring for patients with cerebrovascular stroke are very important to improve their performance that affect positively on quality of care and prevent complication of cerebrovascular stroke.

Concerning difference between satisfactory level of total nurses' knowledge, practice and attitude regarding proper positioning and early mobilization of the patient with stroke pre- & post- educational guidelines intervention, the current study found that there was a significant improvement in total scores of nurses' knowledge, practice and attitude post educational guidelines implementation as compared by pre implementation phase. These results could be due

to implementation of the educational guidelines which introduced the knowledge and practices regarding proper positioning and early mobilization of the stroke patient, that were based on their previously assessed needs and consequently improved their attitude when the nurses became more aware with their role and the importance of correct positioning and early mobilization of the stroke patients and its effect on patients' outcome. These results are in agreement with *McCluskey et al., (2013)* who stated that Overall, nurses have expressed positive attitudes, desires, and willingness to participate in education sessions on clinical practice guidelines and increase their use in clinical practices.

The findings of the current study accept the first research question, that there was a statistically significance differences between pre & post educational guidelines intervention regarding the studied nurses' performance (knowledge, practice and attitude) regarding positioning and early mobilization for the stroke patients.

In relation to common errors and neglected nurses' practice regarding patients' positioning pre and post guidelines implementation, the results of the current study showed that the majority of the nurses were neglected practices such as place pillow beneath affected hip, ensure feet in neutral position, sit patient upright well supported by pillows, place arms on pillows, support legs for comfort, keep feet flat on floor or footrests, keep knees directly above feet, tell the patient what you are going to do and make sure the patient is ready. In relation to some items neglected by the nurses which need some aids as pillows and support devices, this may be due to a decrease in the unit facilities and equipment as reported by the nurses, while the others could be due to the negative attitudes of nurses whereby new information learned at guidelines implementation was not readily applied frequently in the clinical practice, which might be justified by shortage of time. *Jansson et al., (2013)* added that some nurses felt that balancing care in different situation was more necessary than adhering to clinical practice guidelines.

This point of view was supported by *May et al., (2014)*, who emphasized that Identifying barriers and facilitators help nurse leaders and healthcare providers to create strategies to implement clinical practice guidelines. A successful implementation can happen when clinical practice guidelines are integrated with nurses' workflow with continuing education to increase knowledge and practice. So, a continuous education and training for nurses is very important to refresh and update their knowledge and practice and keep their positive attitude.

Regarding availability of resources at the study setting that needed for proper positioning and early

mobilization for stroke patients as stated by the study nurses, the current study revealed that, non-human resources, support devices, pillow and chairs were found insufficiently as stated by the study nurses. While, lift devices, presence of follow up system for early detection of complications and documentation were not found. Regarding number of nurses and physiotherapist as human resources was found insufficiently. These results explained the reasons for some of the neglected items in nurses practice post educational guidelines implementation as place pillow beneath affected hip, ensure feet in neutral position, sit patient upright well supported by pillows, place arms on pillows, support legs for comfort, as these steps need more resources as pillows which were not available sufficiently. These results is on the same line with *Fitzpatrick (2014)* who explained that, within the ICU, barriers to early mobility and proper positioning may include insufficient human and equipment resources, patients' physiologic instability and lack of emphasis on the value and priority of mobilizing patients.

Part 3:

Regarding Difference between patients in the study and control group regarding their demographic characteristics. The current study findings revealed that the highest percent of the study and control groups of patients under the study their ages were 50-60 years old. Around two thirds of them males, most of them diagnosed as ischemic stroke. These findings could be due to the truth that ischemic stroke usually associated with ischemic changes of old age. In relation to length of hospitalization, more than half of the patients in the control group and the study group, their length of hospitalization were 5 weeks. Additionally, about three quarters of the patients in the control group and less than two thirds of the study group were hemiplegic with no statistically significant difference between them concerning all characteristics of patients in the study and control group.

These findings are similar to those of *Poletto et al. (2015)*, as the mean age of the study group and control group in his study was 65 years old and all of them diagnosed as Ischemic stroke. And *Centers for Disease Control and Prevention (CDCP), (2010)* reported that most people who have a stroke are older than sixty-five years of age, and most common in males. Also, *Liu et al., (2013)* emphasized that the decline in functional ability that older patients experience in hospital may be related to extended periods of time spent supine in bed and that may increase a hospital length of stay.

Regarding the effect of proper positioning and early mobilization on patients' outcome, *Scottish Intercollegiate Guidelines Network, 2010*, mentioned that positioning patients correctly, and assisting them

to sit up in bed early in their stroke care helps to prevent complications, and this should be considered in developing individualized management plans. After patients have been assessed, they should be given an individualized positioning plan.

The results of the present study revealed that, concerning Patients' outcome that was measured through assessment of improper positioning and late mobility related complications and determine the difference between patients in the study and control group regarding complications pre- and post-educational guidelines intervention. It was found that, although there was no statistically significant difference between study and control groups regarding complications incidence there was a significant reduction in study group as compared to control group. These finding mean that the educational guidelines implementation had an effect on nurses' performance regarding proper positioning and early mobilization of the patient with stroke which was reflected on the study group reduction of complications incidence, but this reduction was not statistically significant which could be due to another and multiples factors and variables which may contribute to these complications as bed sore, chest infection and DVT, in addition to inadequate resources and supplies. In congruence with this finding *Skarin, (2011) and Askim et al. (2012)*, stated that, the benefits of early mobilization, when patients' clinical condition allows, are greater than the risks when it is delivered by appropriately trained staff using a management programme on a stroke unit. However, *Olkowski et al., (2013)*, stated that improper positioning and late mobility of the stroke patients increases the risk of pneumonia, atelectasis, deep venous thrombosis, pulmonary embolism, contractures, muscle atrophy, and bedsores and that immobility is a factor in one half of the deaths within 30 days after an ischemic stroke.

The current study findings reject the research question number two regarding relation between educational guidelines intervention and patient outcome, as it was found that, there was no statistically significant difference between pre & post educational guidelines intervention regarding the stroke patients' outcome, although there was slight reduction in complications incidence in the study group.

Part 4:

Regarding correlation between the studied nurses' knowledge with practice and attitude regarding proper positioning and early mobilization for stroke patients pre- & post- guideline intervention. The current study found that, there was no statistically significant correlation between the studied nurses' knowledge and attitude regarding proper positioning and early mobilization of stroke patients' pre-

guidelines intervention. While, there were statistically significant positive correlations between total knowledge and practice pre- & post-guidelines intervention and between total knowledge and attitude post- guidelines intervention. Incongruent with the current study, *Das and Kumar (2013)* who reported that, attitude toward stroke is affected by the accurate knowledge along with the practices when caring for patients with stroke, positive attitude and proper practices when caring for patients with of stroke is necessary in dealing with a stroke patients to prevent both mortality and morbidity. Also, *Ebben et al. (2015)* identified work experience as a factor because nurses with more work experience felt a higher level of autonomy

Concerning correlation between the studied nurses' practice and attitude regarding proper positioning and early mobilization for stroke patient pre- & post- guideline intervention, the study results showed that, there was no statistically significant correlation between the studied nurses' practice and attitude regarding proper positioning and early mobilization for stroke patient's pre- guidelines intervention. While, there was a statistically significant correlation between them post- guidelines intervention. Incongruent with this finding *Uustal, (2013)* who clarified that, it was anticipated that nurses' increased understanding would increase their confidence and also motivation to get patients moving earlier and more frequently. The potential long term outcomes or impact would be consistent incorporation of mobility activities into patient care and increased empowerment of critical care staff in decision-making regarding patient mobility, therefore increasing the standard of care for the stroke care unit and ultimately improved patients' outcomes.

Conclusion:

Based on findings of the present study, it can be concluded that:

Education guidelines regarding positioning and early mobilization of the stroke patients had positive effect on nurses' knowledge, practice and attitude with a statistically significant difference between pre- and post- guidelines intervention. While, the most of complications of poor positioning and late mobilization as a stroke patients' outcome were slightly decreased but there were no significant differences between pre and post- guidelines intervention.

Recommendation:

Based on the finding of the present study, the researcher recommended:

❖ The importance of implementing orientation and periodic in-service training program for nurses in

ICU regarding positioning and early mobilization of stroke patient for continuous updating their knowledge and practice.

❖ Further studies are recommended to evaluate the reflection of in-service training program focusing on risk assessment and prevention of complications related to poor positioning and late mobilization of stroke patient.

❖ Establishing standards nursing care regarding positioning and early mobilization of the stroke patient at ICU and stroke unit.

❖ Developing a simplified and comprehensive booklet including guidelines about positioning and early mobilization of the stroke patient at ICU and stroke unit.

❖ The study should be replicated on large sample and different hospitals setting in order to generalize the results.

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