

## Educational Sessions about Transient Ischemic Attack to Prevent Stroke among High Risk Clients

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**Abstract:** Transient ischemic attack (TIA) is a sudden interruption in arterial blood flow to the brain lasting only seconds; but it may be a warning sign for stroke. Lacking of knowledge among high risk clients may increase the risk. So, the choice of primary prevention through educational sessions to increase the client's awareness about TIA is very essential for prevention of stroke. The aim of the study was to evaluate the effect of educational sessions about TIA to prevent stroke among high risk clients. **Subjects and method:** A Quasi-experimental design was used. **Subjects:** A total of 160 clients were recruited from the outpatient clinics of El-Minia University Hospital, El-Minia Governorate, Egypt. **Tools for data collection:** Four tools were used: (1) a structured interviewing questionnaire; (2) ABCD<sup>2</sup> risk assessment tool (3) Physical Activity Scale for the Elderly (PASE), and (4) knowledge assessment questionnaire. **Results:** the mean age of the studied sample was 56.8± 5.5 years old. There were a statistically significant differences between the pre-post test regarding the indicators for stroke risk reduction (weight, abdominal circumference, blood pressure, blood glucose level, cholesterol level, physical activity, and knowledge) after implementation of the educational sessions ( $P < 0.05^*$ ). Also, there was a reduction in the mean score for stroke risk during the post-test as compared to the pre-test for the intervention group. **Conclusion:** the educational sessions about TIA affected positively on the clients and reduced the risk for stroke. Likewise, the intervention group has more knowledge about TIA and stroke than the control group. **Recommendations:** The educational sessions should be available in a form of an illustrated booklet in the outpatient clinics and educating the community groups about importance of lifestyle modifications for high risk clients to prevent stroke.

**Keywords:** Transient ischemic attack (TIA), Stroke, High risk, ABCD<sup>2</sup>, PASE

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### I. Introduction

Transient ischemic attack (TIA) is a short period of neurologic dysfunction resulting from a temporary insufficiency of the circulation in part of the brain. It can occur for only a few minutes no more than 24 hours, and then the client will regain his consciousness(1). If it lasts longer than 24 hours is defined as a stroke and the risk of stroke is highest in the first 48 hours following a TIA. It was reported that 10.5% of patients with a TIA experienced a stroke within the next 90 days, along with half of these occurring in 48 hours (2). According to the statistics from the World Health Organization, (WHO, 2016) (3) TIA affects more than 200,000 patients yearly in the United States, and it precedes around 14% to 23% of strokes. However, it occurs in twelve to thirty percent of patients who experience a stroke (4). In Egypt, TIAs occurred in 13.3% of patients who experience a stroke; it affects 35 people per 100,000 of the population each year (3).

TIA can be caused by a blood clot in an artery of the brain or by a clot that travels to an artery of the brain from the body. Other causes include narrowing or an injury of a blood vessel in the brain (5). Sometimes fatty deposits that can temporarily block an artery supplying blood to the brain may cause a TIA. These fatty deposits, called plaques are build-ups of cholesterol within the blood vessels (6). However, the common risk factor of TIA are including hypertension, unhealthy diet, physical inactivity, diabetes mellitus, cardiac causes, hyper-cholesteremia, excessive alcohol intake, depression, stress, atherosclerosis, atrial fibrillation, smoking, and obesity (7,8,9,10).

The clinical features of TIA begin suddenly and depend on the part of the brain that becomes ischemic, it is temporary and reversible, these symptoms usually last a few minutes and will be recovered within 24 hours (11).The most common symptoms are muscle weakness, pain often occurs on one part of the body, as well as unsteady walk or affected gait. They may also have slurring of speech, difficulty speaking or blurring of the vision, temporary blindness in one eye, and lack of coordination or dizziness. The intensity of the symptoms may be ranged from mild to severe (12).

Fluctuation of TIA symptoms may be an important predictor of subsequent stroke (13). Identification of those at highest and lowest risk of stroke in the first days and weeks after a TIA would allow appropriate use of secondary prevention strategies. High clinical scores in TIA patients may detect patients at a very high risk for stroke, who could be targeted for more preventive intervention (14). Subsequently, early identification and treatment reduced the risk of subsequent stroke, disability, and mortality (15).

The nurses have a unique role in the initial evaluation, diagnosis, management, and patient education (16, 17). Urgent evaluation is necessary for patients with symptoms of TIA which includes neuro imaging, cervico cephalic vasculature imaging, cardiac evaluation, blood pressure assessment, and routine laboratory testing. The ABCD<sup>2</sup> score is the abbreviation for age, blood pressure, clinical features, and duration of symptoms for TIA. It should be determined during the initial evaluation and can help to assess the immediate risk of repeated ischemia and stroke (18). In addition, the main clinical features related to an impending stroke include the primary diagnosis of TIA which include the increased age, deficiency lasting more than ten minutes, history of gait trouble, dysarthria, high blood pressure, atrial fibrillation indicated by ECG, and infarction on computed tomography (19).

Nurses play an important role in patient care. They frequently are on the front line regarding high risk group to prevent TIA through educating the patient about signs, symptoms, modifiable risk factors, medication, and lifestyle changes (17, 20). There is no doubt that, primary care plays a crucial role in the prevention of TIA and stroke (21). The primary prevention focuses on educating high risk clients to understand the significance of healthy lifestyle is important to achieve the benefits of management. Lacking knowledge among high risk clients may affect lifestyle modification and may going patients to TIA and stroke (7, 22, 23).

## **II. Significance of The Study:**

TIA may not seem significant to patients and providers, but it should be considered a true medical emergency. It is often a warning of an impending stroke. The incidence rate of TIA recorded in many parts of Egypt as Al Quseir city was about 1.8/1,000, and in Al Kharga district was 2.5/1,000 (24). The number of TIA and stroke clients in El-Minia University hospital were 348 during the year 2016 (25). The critical clinical problems for physicians and nurse practitioners who evaluate these patients are to identify that the patient has had a transient ischemic attack or stroke and to stratify risk to determine if the patient requires rapid intervention to prevent recurrent stroke (26).

The patient who is recovering from a mild stroke or who has had a recent TIA is at high risk for stroke recurrence (17, 27). The overall risk of stroke has been reported to be between 5% and 10% within the first two days and between 11% and 17% at 90 days. Within one year of a TIA, roughly 12% of patients will die; at 10 years, 43% will have experienced a stroke (28). The medical surgical and community health nurses can play an important role in prevention of stroke through the implementation of the educational sessions about TIA. So, the choice of primary prevention and educational sessions to increase the client's awareness about TIA is very essential for the clients to prevent stroke.

**Aim of the study:** - The study aimed to evaluate the effect of educational sessions about TIA to prevent stroke among high risk clients.

## **III. Research Hypothesis:**

1. Educational sessions about TIA will affect positively on the clients and reduce the risk for stroke.
2. The intervention group will have more knowledge about TIA and stroke than the control group.

## **IV. Subjects and Method:**

### **Research Design:**

A Quasi-experimental (time series non-equivalent control group) research design was adopted in this research. A particularly powerful quasi-experimental design results when the time series and non-equivalent control group designs are combined. Numerous variations on the simple time series design are possible and are being used by nurse researchers (29).

### **Setting:**

The current study was conducted at the outpatient clinics for patients with diabetes, hypertension and cardiac diseases of El-Minia University Hospital, El-Minia Governorate, Egypt.

### **Sample:**

A Purposive sample of 160 clients was recruited after their acceptance to participate in the study. They were assigned to two groups (80 for the intervention group and 80 for the control group). The clients were enrolled based on the inclusion and exclusion criteria. Informed consent was then obtained from them.

**The sample size:** The sample sizes were calculated according to the following equation:  $n = t^2 \times p(1-p) / m^2$

Where

**n** =required sample size

**t** = confidence level at 95% (standard value of 1.96)

**p** = estimated prevalence of risk (0.052)

**m** = margin of error at 5% (standard value of 0.05)

$n = (1.96)^2 \times 0.052(1 - 0.052) / (0.05)^2 = 75.74$  add 5 cases = 80 clients for each group.

**Inclusion criteria:** age over 18 years with at least one modifiable risk factor for TIA and stroke such as arterial hypertension, diabetes mellitus, arterial fibrillation, hyper-cholestermia, obesity and physical inactivity.

**Exclusion criteria:** patients experiencing moderate or severe stroke.

#### **Tools for data collection:**

**1-Structured interviewing questionnaire:** It was designed by the researchers based on the review of the related literatures, which included the following:

**a- Socio-Demographic characteristics** such as age, sex, residence, marital status, education, occupation, family history, and family income.

**b- Clinical data:** - Which included questions about the patient's complaints, past and present medical histories of chronic disorders, and medications.

**c- Measurements:** This included blood pressure, blood glucose level, weight, height, and body mass index (BMI). The BMI was estimated by dividing weight in kilogram divided by squared height in meters [BMI = weight (kg)/height (m)<sup>2</sup>]. A BMI of less than 18.5 was underweight; a BMI from 18.50 - 24.99 considered normal while a BMI from 25 – 29.9 considered overweight and  $\geq 30$  was considered obese (30).

**2- ABCD<sup>2</sup> risk assessment tool:** The ABCD<sup>2</sup> score is a risk assessment tool designed to improve the prediction of stroke risk after TIA. The score is optimized to predict the risk of stroke within 2 days after a TIA, but also predicts stroke risk within 90 days. The ABCD<sup>2</sup> score is calculated by summing up points for five independent factors. This factors include age  $\geq 60$  years old (equal 1 score), blood pressure  $\geq 140/90$  mm Hg (equal 1 score), clinical features of TIA (equal 1 score for speech impairment without unilateral weakness and 2 for unilateral weakness with or without speech impairment), duration of TIA (2 scores for TIA  $\geq 60$  minutes and 1 score for duration from 10-59 minutes), and diabetes (1 score) (31).

**3-Physical Activity Scale for the Elderly (PASE):** - Is a practical and widely used approach for physical activity assessment in epidemiologic investigations (32). PASE was initially developed in early 90s to provide an instrument to investigate specifically older people with an age specific physical activity questionnaire, filling what was an important need in epidemiological research at that time. The questionnaire comprises section on leisure time activity, household activity and work-related activity (33). If the client never do the activity the response will equal (0), seldom perform the activity (1-2 days/week) equal (1), sometimes perform the activity (3-4 days/week) equal (2), and often (5-7 days/week) perform the activity equal (3).

**4-knowledge assessment questionnaire:-** It was developed by the researchers after extensive literature review and it was included the following items: definition of TIA, causes, signs and symptoms, risk factors measures followed to control of TIA and how to prevent it. Clients responses to the questions regarding knowledge items mentioned above were scored as (2) for a correct complete answer and (0) for an incorrect answer, and (1) for the incomplete answer. The total knowledge scores were classified into three levels: score  $\geq 50$  was considered poor knowledge, 50-70% was considered satisfactory and good knowledge when the score  $\geq 70\%$ .

**Reliability and validity of the tools:** Tools were submitted to a panel of four experts in the field of Medical surgical nursing and Community health nursing to test the content validity. Modifications were carried out according to the panel judgment on the clarity of the sentences and appropriateness of the content. Reliability test was assessed by applying the questionnaire to 10 clients using test-retest. As regards to PASE tool, it is a valid and reliable tool to assess activities. It has been established by correlating PASE scores with health status and physiologic measures. The PASE test-retest reliability coefficient (0.75) exceeded those reported for other physical activity surveys (33).

**Pilot study:** A total of 10% of the sample was included in the pilot study in order to assess the feasibility and clarity of the tools and determine the needed time to answer the questions. Based on its result changes were carried out. Pilot study revealed the average length of time needed to complete the structured interview schedule; it was approximately 30 minutes with each client. The sample included in the pilot study was excluded from the study sample.

**Fieldwork:**

Before conducting the study, permission was obtained from administrative personnel of El-Minia University Hospital and informed consent of the clients who were participated. The data collection period was for ten months, starting from the beginning of September 2016 to the end of June 2017. Data collection was carried out in three phases: interviewing and assessment phase, implementation phase, and evaluation phase.

**Interviewing and assessment phase:**

During the first session the researcher explained the aim of the study, the components of the tools, the natural course of the disease, and how to prevent it. Then the researchers select the studied group first and completing the work with the studied subjects (80 clients) then select the control group (80 clients) to avoid sample contamination. The time needed for completing the questionnaire ranged from 20 to 30 min for each client.

**Implementation phase:**

The obtained information used as the baseline assessment (pre-test), then in study group, eighty clients were divided into ten groups (7-9 clients) in each group according to age, gender and educational level and medical diagnosis. Each group had one session per week for a period of one month by referring to the researcher's manual. Each session took about 30 – 45 minutes. Before beginning the session usually started by measuring includes blood pressure, blood glucose level, cholesterol level, weight, height and body mass index, natural of the diseases and how to modify the lifestyle to prevent stroke. The clients were also given hand-outs based on the researchers' booklet' after extensive literature review related to the disease in clear Arabic and how to follow it to prevent stroke.

**Evaluation phase:**

In this phase: The studied and control group members were reassessed at 3 months and then 6 months after the first assessment. All clients attended the follow-up sessions at the outpatient clinic.

**Ethical Considerations:** An official permission was taken from the authoritative personal in the hospital. The researchers introduced themselves to the clients who met the inclusion criteria and informed them about the aim of the current study in order to obtain their acceptance to share in this study. Written consent was obtained from them. Confidentiality and anonymity of them were assured through coding the data.

**Statistical analysis:** Data were coded and transformed into a specially designed format suitable for computer feeding. All entered data were verified for any errors. Data were analyzed using statistical package for social sciences (SPSS) version 20 windows and were presented in tables and graphs. Chi-square analysis was performed and paired t-test was used in comparison between two related groups having quantitative data. Also, repeated measures ANOVA, mean and standard deviations were computed. An alpha level of 0.05 was used to assess significant differences.

## V. Results

The study sample included 160 clients from the outpatient clinics for clients with diabetes, hypertension and cardiac diseases of El-Minia University Hospital, El-Minia Governorate, Egypt; with the mean age of the studied sample was  $56.8 \pm 5.5$  years old. Table 1 illustrates the general characteristics of the studied sample. According to the table, the mean age of the control group was  $56.82 \pm 6.01$  years, while the mean age of the intervention group was  $56.81 \pm 5.01$  years. Additionally, more than half of the total sample were females (53.1%) and 58.1 % of them were living in urban areas, and 56.5% are working. The majority of the sample was married (70.6 %) and one-third of them were illiterate (33.75%) compared with 14.35% university education.

Table 2 clarifies that; the most of the reported clinical featured in the studied sample were a headache, weakness, dyspnea, body pain, dizziness, numbness, and vertigo (61.9%, 46.2%, 42.5%, 33.8%, 32.5%, 31.2%, 5.6 % respectively).

Table 3 shows the ABCD<sup>2</sup> scoring system for assessing the stroke risk during pre and post-test. There was a reduction in the mean score for stroke risk during the post-test as compared to the pre-educational sessions test for the intervention group. In contrast, the stork risk was increased during the post-test among the control group.

Table 4 confirms the PASE scoring system for physical activity during pre and post-test. There was an increase in the mean score of the study sample in terms of PASE scoring system to maintain physical activity with statistically significant differences between pre and post-test ( $P < 0.001^*$ )

Table 5 represents the lifestyle modifications that were controlled by the clients included the weight (obesity), hypertension (systole & diastole), diabetes mellitus (blood glucose level), and hyper-cholesteremia

(cholesterol level). There was a reduction in the mean score during post 1, & post 2 for the intervention group with statistically significant differences ( $P < 0.05^*$ ). In contrast, for the control group, there was no statistically significance differences between the pre and post-test ( $P > 0.05$ ).

Table 6 shows the main indicators for stroke risk reduction for the intervention group. It displays that there were a statistically significant differences between the pre and post-test regarding the indicators for stroke risk reduction (weight, abdominal circumference, blood pressure, blood glucose level, cholesterol level, physical activity, and knowledge) after implementation of the educational counseling ( $P < 0.05^*$ ).

Table 7 clarifies the clients' pre and post knowledge scores and categories about TIA. There was observed an increase in the post knowledge scores for the client about TIA. Furthermore, there were a statistically significant differences between pre and post-test regarding the knowledge of the client ( $P < 0.001^*$ ). **Added to that**, figure (1) illustrates that; there was observed an increase in the post knowledge scores for the intervention group about TIA as compared to the control group.

**Table (1): Socio-demographic characteristics for the studied sample (n=160)**

Demographic characteristics	Control group (n=80)	Intervention group (n=80)	% for the total sample	p-value
<b>Age:</b>	56.82 ± 6.01	56.81 ± 5.01	56.8 ± 5.5	P > 0.05
<b>Sex:</b> Male	43.8	50.0	46.9%	X <sup>2</sup> =0.6
Female	56.2	50.0	53.1%	P > 0.05
<b>Residence :</b>				
Urban	56.2	60.0	58.1	X <sup>2</sup> =0.2
Rural	43.8	40.0	41.9	P > 0.05
<b>Education:</b>				
Illiterate	37.5	30.0	33.7	X <sup>2</sup> =1.7
Read & write	23.8	25.0	24.5	P > 0.05
Secondary school	27.5	27.5	27.5	
University	11.2	17.5	14.3	
<b>Working condition:</b>				
Work	48.8	65.0	56.9	X <sup>2</sup> =4.3
Not work	51.2	35.0	43.1	P < 0.05*
<b>Marital status:</b>				
Single	3.8	3.8	3.8	X <sup>2</sup> =0.8
Married	67.4	73.8	70.6	P > 0.05
Widow	28.8	22.4	25.6	

**Table (2): Clinical features of TIA among the studied subjects (n=160)**

Clinical features	Control group (n=80)	Intervention group (n=80)	% for the total sample	P value
Chest pain	32.5	46.2	39.5	X <sup>2</sup> =3.1 P > 0.05
Dyspnea	32.5	52.5	42.5	X <sup>2</sup> =6.5 P < 0.05*
Slurred speech	3.8	5.0	4.4	X <sup>2</sup> =0.1 P > 0.05
Numbness	21.2	41.2	31.2	X <sup>2</sup> =7.4 P < 0.05*
Weakness	35.0	57.5	46.2	X <sup>2</sup> =8.1 P < 0.05*
Dizziness	21.2	43.8	32.5	X <sup>2</sup> =9.2 P < 0.05*
Hemiplegia	3.8	1.2	2.5	X <sup>2</sup> =1.02 P > 0.05
Body pain	25.0	42.5	33.8	X <sup>2</sup> =5.4 P < 0.05*
Double vision	3.8	7.5	5.6	X <sup>2</sup> =1.06 P > 0.05
Aphasia	3.8	8.8	6.2	X <sup>2</sup> =1.7 P > 0.05
Ataxia	1.2	3.8	2.5	X <sup>2</sup> =1.02 P > 0.05
Vertigo	1.2	10.0	5.6	X <sup>2</sup> =5.7 P < 0.05*
Cold sweet	3.5	10.0	6.9	X <sup>2</sup> =2.4 P > 0.05
Headache	51.2	72.5	61.9	X <sup>2</sup> =7.6 P < 0.05*
Abdominal pain	35.0	35.0	35.0	X <sup>2</sup> =0.0 P > 0.05

**Table (3): ABCD<sup>2</sup> scoring system for assessing stroke risk before and after educational sessions for the studied participants (n=160)**

ABCD <sup>2</sup> scoring system Mean ± SD				
	Pre	Post1	Post 2	p-value
<b>Intervention group</b>	3.8 ± 1.08	3.6 ± 0.9	3.5 ± 0.9	P > 0.05
<b>Control group</b>	4.2±1.1	4.05±1.1	4.6±1.2	P<0.05

**Table (4): PASE scoring system for assessing physical activity during pre, post1 and post2 test for the studied sample (n=160)**

PASE mean scoring Mean ± SD				
	Pre	Post1	Post 2	p-value
<b>Intervention group</b>	11.48 ± 3.8	13.4 ± 3.2	14.2 ± 3.5	P < 0.001*
<b>Control group</b>	9.65±3.5	10.28±3.4	10.28±3.9	P < 0.05*

**Table (5): Lifestyle modifications for the modifiable risk factors among the studied participants (n=160)**

Modifiable risk factors	Control group			Intervention group		
	Pre	Post1	Post2	Pre	Post1	Post2
Obesity :	60.0%			71.3%		
Weight	89.6±10.4	90.1±11.2	90.3±11.4	92.1±11.1	91.6±11.9	90.03±11.4
	P>0.05			P<0.05*		
Hypertension:	57.5%			67.5%		
Systole	162.9±13.5	164.3±14.8	164.6±13.8	159.9±15.5	156.6±15.6	153.9±14.4
Diastole				93.7±4.7	92.3±4.2	91.1±2.8
	P>0.05			P<0.05*		
Diabetes mellitus:	38.8%			43.8%		
Blood glucose level	215.6±40.5	211.6±34.1	206.2±35.1	232.7±50.1	221.9±50.5	205.7±44.2
	P>0.05			P<0.05*		
Hyper-cholesteremia:	48.6%			29.3%		
Cholesterol level	14.2±2.2	14.05±2.2	14.3±2.6	11.8±3.9	10.9±3.7	9.9±3.6
	P>0.05			P<0.05*		

**Table (6): Indicators for stroke risk reduction among the intervention group (n=80)**

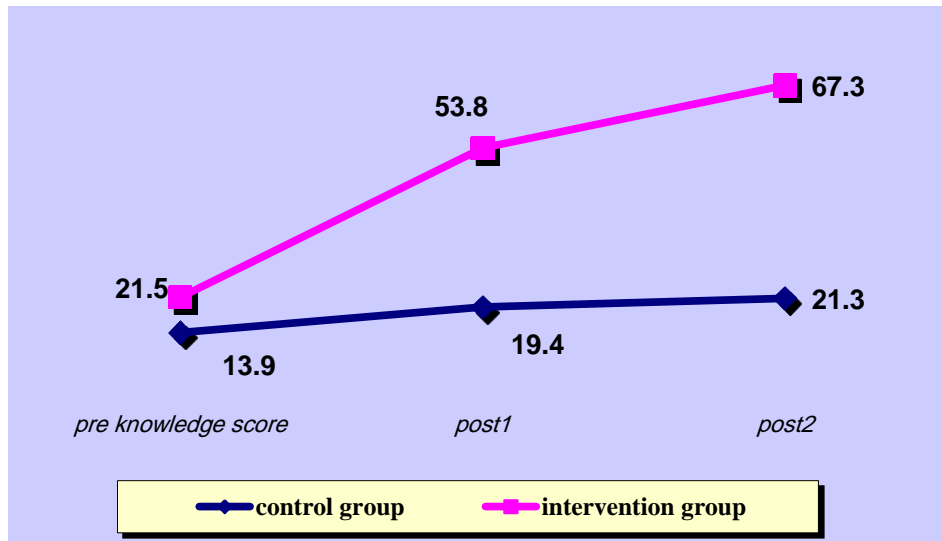
Indicators	Pre	Post1	Post2	P value
<b>Weight</b>	85.9±14.4	85.3±14.6	83.7±14.4	P<0.001*
<b>Abdominal circumference</b>	49.8±7.9	49.4±8.2	47.9±8.7	P<0.001*
<b>Systolic blood pressure</b>	159.9±15.5	156.6±15.6	153.9±14.4	P<0.05*
<b>Diastolic blood pressure</b>	93.7±4.7	92.3±4.2	91.1±2.8	P<0.05*
<b>Blood glucose level</b>	232.7±50.1	221.9±50.5	205.7±44.2	P<0.05*
<b>Cholesterol level</b>	11.8±3.9	10.9±3.7	9.9±3.6	P<0.05*
<b>PASE score</b>	14.2 ± 3.5	13.4 ± 3.2	11.48 ± 3.8	P<0.001*
<b>ABCD<sup>2</sup> score</b>	3.5 ± 0.9	3.6 ± 0.9	3.8 ± 1.08	P>0.05
<b>Knowledge</b>	21.5±13.6	53.8±21.05	67.3±17.9	P<0.001*

**Table (7) Total mean score and levels of knowledge during the pre and post-test for the studied subjects**

Knowledge	Control group (n=80)	Intervention group (n=80)	P value
<b>Total Mean Score of Knowledge</b>			
Pre	13.9±7.8	21.5±13.6	P<0.001*
Post1	19.4±14.5	53.8±21.05	
Post2	21.3±17.8	67.3±17.9	
<b>Pre Level of Knowledge</b>			P<0.001*
Poor ≥ 50	100.0	97.5	
Satisfactory 50 - 70	0.0	2.5	
Good ≤ 70	0.0	0.0	
<b>Level of Knowledge (post1)</b>			P<0.001*
Poor ≥ 50	92.5	41.3	
Satisfactory 50 – 70	7.5	32.4	
Good ≤ 70	0.0	26.3	

Level of Knowledge (post2)			
Poor $\geq 50$	88.8	12.5	P<0.001*
Satisfactory 50 - 70	8.8	40.0	
Good $\leq 70$	2.4	47.5	

Figure (1) comparison between the control and intervention group regarding to the total mean knowledge score during pre and post-test



## VI. Discussion:

TIA is the same as a stroke, except that symptoms only last for a short amount of time. Patients with TIA are clinically unstable, with fear of developing a handicapping stroke. Identification of persons at highest and lowest risk of stroke in the first days and weeks after a TIA would allow the use of appropriate secondary prevention strategies (14). Early detection and treatment of TIA can reduce the risk of stroke, disability, and mortality (15). Therefore, the aim of the current study was to evaluate the effect of educational sessions about TIA to prevent stroke among high risk clients.

One hundred and sixty clients were included in the study with the mean age  $56.8 \pm 5.5$ . The findings of the current study covered three main areas discussed within the following frame of references: First, socio-demographic characteristics of patients, and patients' clinical features of TIA. Second, total mean score for ABCD<sup>2</sup> scoring system for assessing stroke risk and PASE scoring system for assessing physical activity during before and after educational sessions; third, the effect of educational sessions on lifestyle modification, stroke risk reduction and level of knowledge for the studied participants.

### I- First, socio-demographic characteristics of patients, and patients' clinical features of TIA:

Findings of the current study presented that; female patients represented slightly more than half of the total sample. This finding was not corresponding with (43, 35) they mentioned that TIAs are higher among males than among females. This might be due to that most of clients who knew their diagnosis and agreed to participate in the study were females. In relation to the education of the clients, the results of the present study revealed that, the highest percentage was illiterate and the lowest percentage was university graduates. This finding in accordance with (36) who mentioned that, most of the sample was illiterate; this might be due to the role of education in health awareness.

Concerning residence, in the current study it was found that more than half of the total sample was from urban area. This finding comes in agreement with (14) who stated that, most of their patients were from urban area. This might be due to the ease of conductors and proximity to the hospital from the urban area. In relation to clients' work, the study finding showed that nearly two thirds were working. This might be due to the stress of working life that increases the risk factors. And more than two-thirds of the sample was married.

Regarding to the clinical features of TIA among groups, there were statistically significant differences and an increase in the total sample percentage for the presence of dyspnea, numbness, weakness, dizziness, body pain, vertigo, and headache. This finding was in line with (37) who mentioned that, most of the symptoms that patients have had to go to the hospital are such as those symptoms mentioned earlier.

**Second, total mean score for ABCD<sup>2</sup> scoring system for assessing stroke risk and PASE scoring system for assessing physical activity during before and after the educational sessions:**

**ABCD<sup>2</sup>:** It is a prognostic score to recognize the clients who are at high risk for stroke after a TIA. Patients who have had a suspected TIA should be assessed as soon as possible for their risk of subsequent stroke using a validated scoring system, such as ABCD<sup>2</sup>. Conversely, patients who are at high risk of stroke that is, with an ABCD<sup>2</sup> score of four or more should have measures for secondary prevention introduced as soon as the diagnosis is established, including discussion of the individual risk factors (20). Accordingly, the present study used this tool to identify the risk and assess its level. The current study referred that, there was a reduction in the mean score for stroke risk during the post-test as compared to the pre- educational sessions test for the intervention group. In contrast, the stroke risk was increased during the post-test among the control group. This might be due to the effect of educational sessions that increase the client's awareness and reduce the score of ABCD<sup>2</sup>.

**PASE:** It a wide use scale, the nurse should use to assess physical activity. Physical activity is a very important indicator for stroke risk reduction. The present study described that, there was an increase in the mean score of the study sample in terms of PASE scoring system to maintain physical activity with statistically significant differences between pre and post-test ( $P < 0.001^*$ ). This comes in agreement with (38) who mentioned that, aged adults' physical performance is measured in many circumstances and with various tools. The Physical Activity Scale for the Elderly (PASE) is a common instrument and broadly used scale.

**Third, the effect of educational sessions on lifestyle modification, stroke risk reduction and level of knowledge for the studied participants:**

Lacking of knowledge among high risk group patients may affect lifestyle modification and may going patients to TIA and stroke. So, educating them to understand the significance of healthy lifestyle is essential to accomplish the benefits of management (7, 39). Hence, educational sessions for the high risk clients are a vital role for nurses and can help to reduce the risk.

In relation to lifestyle modification for modifiable risk factors and indicators for stroke risk reduction; the present study results documented that, there was highly statistically significant improvement after educational sessions through many items related to weight reduction, obesity and abdominal circumference. This supported by (7) who reported that, both general and abdominal obesity are associated with subsequent stroke. Moreover, (40) found that promoting weight loss and the maintenance of a healthy weight should be given a high priority. But, Gao (22) et al., (2007) not matching with this point of view and detailed that, no study had confirmed that weight reduction will decrease stroke.

Regards to controlling hypertension, (41) found that hypertension is the most important risk factor for both TIA and ischemic stroke patients. Added to that, (42, 43) reported that, reduction in systolic blood pressure with a 10 mmHg is associated with a thirty one percent reduction in TIA and stroke and lower mortality from stroke by ten percent risk. In totaling controlling the blood glucose level among the diabetic clients is important in reducing stroke occurrence. Similarly, Nazifah (43) et al., (2012) informed that, this highlights need to recognize lifestyle changes in dietary habits.

Correspondingly, the present study showed that, there were a statistically significant differences between the pre-post test regarding the blood glucose level and cholesterol level, ( $P < 0.05^*$ ). These findings were supported by (44) who mentioned that, behavior modification through education about regular monitoring and appropriate management of blood glucose control affected in reduced TIA and stroke. Related to reduction of total cholesterol level, these findings were parallel to (45) who reported that, reduction of the total cholesterol level will prevent the recurrence of stroke.

As regards clients' knowledge, in the current study, there was an increase in the mean scores of knowledge and highly statistically significant improvement in total knowledge. This difference in knowledge found in the present study might be related to the knowledge acquired from the educational sessions this is similar to the results recounted by (39, 7, 46). They stated that, patients with high risk group of stroke who received counseling program had improvement of their knowledge after implementation of the counseling program. This finding was parallel with (47) who affirmed that, patients who received educational program had continuous improvement of their knowledge.

To summarize, the outcomes of this study revealed that, there was an observed increase in the post knowledge scores for the intervention group about TIA as compared to the control group. This is agree with (39, 7, 46). And (47) who found that, patients who received educational counseling had continuous improvement of knowledge and satisfaction that could lead patient to cooperate in self-care for reducing the adverse events of their disease.

## VII. Conclusion

Based on the findings of the present study, it was concluded that, after the intervention there was a reduction in the client's weight, abdominal circumference, blood pressure, blood glucose level, cholesterol level, and an increase in their physical activity and knowledge. So, the present study findings supported the hypothesis



that, the educational sessions about TIA affected positively on the clients and reduced the risk for stroke. Similarly, the intervention group had more knowledge about TIA and stroke than the control group.

### **Recommendations:**

- 1- Educational sessions should be available in a form of an illustrated booklet in medical, neurological outpatient and emergency departments as a reference for clients. Where the nurses act as an advocate to ensure that the information is provided.
- 2- Health teaching for high risk group clients and continued reinforcement at their follow-up visits to the out patients clinics should be performed for enhancing their compliance towards the therapeutic regimen.
- 3- Educating the community groups about importance of lifestyle modifications for high risk clients to reduce the risk of stroke.
- 4- Nurses have an active role in raising the awareness about the importance of lifestyle modifications for high risk clients to reduce the risk of stroke.
- 5- Further researches are needed with a large sample size to generalize the results.

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