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## Effect of Telenursing Instructions on Improvement of Awareness among Systemic Lupus Erythematosus Patients

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### Abstract

**Background:** Systemic lupus erythematosus is the most common type of lupus and an autoimmune disease in which the immune system of the body mistakenly attacks healthy tissues so, awareness about this disease reduces complications and improves patient's outcome. **Aim:** The aim of the study was to evaluate the effect of tele nursing instructions on awareness of systemic lupus erythematosus patients. **Subjects and Method: Design:** A quasi-experimental research design was used. **Setting:** The study was conducted at the medicine and rheumatology outpatient clinics in Bab El Shaeria University Hospital, affiliated to El-Azhar University, Cairo Governorate Egypt. **Subjects:** A purposive sample was used including 90 patients diagnosed with systemic lupus erythematosus. **Tools of data collection:** Three tools were used; **Tool 1:** A structured designed interview covering two parts: **Part 1:** Demographic characteristics of studied patients **Part 2:** Knowledge of studied patients about systemic lupus erythematosus. **Tool 2:** Attitude of studied patients regarding systemic lupus erythematosus. **Tool 3:** Reported practices of studied patients regarding systemic lupus erythematosus. **Results:** The current study showed that 67.3% of studied sample had poor knowledge, 61.7% of them had negative attitude and 58.4% of them had inadequate reported practices about systemic lupus erythematosus before conducting the telenursing instructions. However, highly statistically significant improvements were detected after the implementation of the telenursing instructions in good knowledge (88.2%), positive attitudes (82.7%) and adequate reported practices (85.6%). There was a positive statistically significant correlation between total knowledge scores and total reported practice scores. Also, there was a positive statistically significant correlation between total knowledge scores and total attitude scores of studied patients. **Conclusion:** Telenursing instructions improved patients' knowledge, attitudes, and practices at the posttest than pretest, with highly statistically significant differences. As well, an increase in awareness about systemic lupus erythematosus was achieved. **Recommendation:** Simple educational pamphlets and posters about systemic lupus erythematosus should be provided for all patients in their outpatient clinics.

**Keywords:** Telenursing Instructions, Awareness, Systemic Lupus Erythematosus

### Introduction

Systemic Lupus Erythematosus (SLE) is a chronic inflammatory autoimmune disease that occurs when the immune system assaults the tissues of the body and its organs. Systemic means that SLE can affect the body's various organs, including the skin, joints, brain, blood cells, kidneys,

lungs, and heart. Lupus refers to the butterfly rash on the patient's face, which is like the whitish outline marking on the middle of wolves' faces. Erythematosus means the rash is reddish to purplish in color. Accordingly, four types of lupus can be identified: systemic lupus erythematosus, neonatal lupus, drug-induced lupus, and cutaneous lupus erythematosus. However,

lupus erythematosus is the most common classification<sup>(1)</sup>.

Systemic lupus erythematosus is a chronic illness, it is characterized by periods when the disease activity is minimal or absent (remission) and when it is active (relapse or flare). The prognosis for patients with lupus today is much better than years ago because of greater awareness and more accurate tests leading to earlier diagnosis and treatment as well as more effective and safer medications and monitoring methods<sup>(2)</sup>.

Systemic lupus erythematosus (SLE) is one of the worldwide autoimmune disorders that has a significant mortality and morbidity. It is a persistent long-term disorder which is more common in women than men for all ages and ethnic groups. Women of reproductive age (15-45) are often affected, and the rate of females to males is 9 to 1. However, if symptoms are present after age 60, the disease tends to run a more benign course. Early mortality, within 5 years, is due to organ failure or overwhelming infections, both of which can be altered by early diagnosis and treatment<sup>(3)</sup>.

The Lupus Foundation of America estimates that at least five million people worldwide, have a form of lupus. Lupus strikes mostly women of childbearing age. The reported prevalence of SLE in the United States is 20 to 150 cases per 100,000. In one meta-analysis, the prevalence was 73 out of 100,000. In women, prevalence rates vary from 164 (White individuals) to 406 (African American individuals) per 100,000. Although data on the prevalence of SLE among Africans and Asians living in the tropics are limited, SLE is reportedly more common and more severe in people of African and Asian extraction living in industrialized countries<sup>(4)</sup>.

People with SLE may experience a variety of symptoms that include fatigue, skin

rashes, fever and pain or swelling in the joints. Among some adults, having a period of SLE symptoms called flares may happen every so often, sometimes even years apart and go away at other times called remission. However, other people may experience SLE flares more frequently throughout their life. Other symptoms can include sun sensitivity, oral ulcers, arthritis, lung problems, heart problems, kidney problems, seizures, psychosis and blood cell and immunological abnormalities. However, the early signs vary widely from person to person<sup>(5)</sup>.

The exact cause of systemic lupus erythematosus is unidentified but there are risk factors that include women (Ninety percent of people with lupus are female especially women during their childbearing years' ages 15 to 44), people of color (Lupus is more common in African-Americans, Hispanics/Latinos, Asian-Americans, Native Americans, Native Hawaiians and some regions of Africa) and individuals with a family history of lupus (having a relative with lupus increases your risk of developing the disease by 5 to 13 percent). Those groups of people are more likely to develop the disease than others. However, viruses, ultraviolet light and drugs all may play role as risk factors<sup>(6)</sup>

Considering diagnostic tests for lupus, there is no one specific test to be used, however, many tests are required to confirm the diagnosis as patient's history, physical examination, laboratory tests as Complete blood count (CBC), Erythrocyte sedimentation rate (ESR), Urinalysis, Blood chemistries, complement levels such as decrease C3 and C4 indicating active disease, Antinuclear antibody test (ANA): sensitive but not specific to SLE. Other autoantibody tests [anti-DNA (specific but not sensitive)], anti-La antibodies, and lupus

erythematosus cell test. Immunoglobulins and complement deposition in the dermal-epidermal junction in 90% of patients can be displayed through a skin biopsy. Kidney biopsy is the most effective tool for the diagnosis of lupus nephritis <sup>(7,8)</sup>.

There are several complications related to systemic lupus erythematosus. So, lupus can damage any major organ or tissue in body. It can affect brain (cause stroke), central nervous system (cause encephalopathy, seizures, numbness and weakness), skin (cause skin scarring, skin rashes, hair loss and mouth sores), heart (cause pericarditis and heart failure), lungs (cause pleuritic or pleurisy), joints (cause arthritis), muscles (cause myositis, or inflammation in the muscles), kidneys (cause kidney failure), cataracts (lupus can affect the eyes) and pregnancy complications <sup>(9)</sup>.

Treatment of SLE often depends on disease severity and disease manifestations. The SLE treatment consists primarily of immunosuppressive drugs that inhibit activity of the immune system. Hydroxychloroquine, corticosteroids (e.g., prednisone) and nonsteroidal anti-inflammatory drugs (NSAIDs) are often used to treat SLE. It is also important to maintain visits with primary care provider for an annual physical as well as other routine checks for health problems. Depending on situation, these may include bone density screening; screening for hyperlipidemia, hypertension and diabetes; and/or screening for women's health issues such as cervical and breast cancer <sup>(10)</sup>.

Early diagnosis and effective treatments can help reduce the damaging effects of SLE and improve the chance to have better function and quality of life. Poor access to care, late diagnosis, less effective treatments, and poor adherence to

therapeutic regimens may increase the damaging effects of SLE, causing more complications and an increased risk of death. Patients must learn to identify and care for their physical symptoms quickly in order to manage their disease more effectively <sup>(11)</sup>.

Telenursing is a component of tele-health that occurs when staff nurses meet the health needs of patients using information, communication, and web-based systems. This has been defined as the delivery, management and coordination of care and services provided through information and telecommunication technologies <sup>(12)</sup>. This technology helps to rapid access of better services, decrease cost, and facilitate easy access to the most appropriate specialized skills and increase the quality of the provision of health services to patients. Furthermore, thorough tele-nursing training and remote consultation for patients can be provided by email for patients and their relatives <sup>(13)</sup>.

Tele-health is defined as “the use of electronic information and telecommunication technologies to support and promote long-distance clinical healthcare, patient and professional health-related education and public health. Tele-nursing is a subcategory of tele-health which concerned on the transfer, management and coordination of care and administrations using telecommunications technology innovation inside the nursing field <sup>(14)</sup>.

Awareness-raising is a process that seeks to inform and educate patients about a topic or issue with the intention of influencing their knowledge, attitudes, behaviors, and beliefs towards the achievement of a defined purpose or goal. The increased awareness about systemic lupus erythematosus would focus on the importance of adherence to medications and follow-up. In addition, it

includes awareness of the physical, emotional and economic impact of lupus<sup>(9)</sup>. Nurses' goals for a patient with systemic lupus erythematosus may include relief of pain and discomfort, relief of fatigue, maintenance of skin integrity, compliance with the prescribed medications, increased knowledge regarding the disease, and absence of complications. Nurses assess for evidence of disease activity and formulate treatment plans in agreement with the specialist team and patient. Nurses by involving the patient in his/her care and providing information about potential risks, alerting the individual to the red flags that need immediate action, they are guiding the patient in the development of self-management skills to improve outcomes<sup>[15]</sup>.

### Significance of the study

Systemic lupus erythematosus has a global distribution with a wide spectrum in the natural disease evolution among various ethnic and geographic populations. The reported worldwide prevalence of SLE vary considerably; this variation is probably attributable to a variety of factors, including differences in ethnicity, geographic area, income level, education, health insurance status, level of social support and medication compliance, as well as environmental and occupational factors. Socio-demographic characteristics such as ethnicity, gender, age, access to health care, disease activity and damage are important variables associated with the outcome of SLE<sup>(16,17)</sup>.

In Egypt, it was reported that about diagnosed SLE are monthly admitted to the Rheumatology Department in Cairo University Hospitals with different signs and symptoms. Systemic lupus erythematosus is associated with significant mortality, morbidity and cost for the individual patient

and society. The SLE is a complex disease to diagnose, treat and manage. Infections are an important cause of morbidity and mortality in SLE<sup>(18)</sup>. In the United States, African Americans (AAs) have 3-4 times greater prevalence of lupus, risk of developing lupus at an earlier age and lupus-related disease activity, organ damage and mortality compared with whites<sup>(12)</sup>.

### Aim of the study

The study aimed to evaluate the effect of tele nursing instructions on awareness of systemic lupus erythematosus patients

### Research Hypotheses:

- H<sub>1</sub>** - Patients' knowledge about systemic lupus erythematosus will improve after applied tele nursing instructions compared to before instructions.
- H<sub>2</sub>** - Patients' attitudes about systemic lupus erythematosus will improve after applied tele nursing instructions compared to before instructions.
- H<sub>3</sub>** - Patients' self-reported practices about systemic lupus erythematosus will improve after applied tele nursing instructions compared to before instructions.
- H<sub>4</sub>** - There will be significant correlations between knowledge, attitudes, and practices of patients understudy regarding systemic lupus erythematosus.

### Subjects and Method

#### Design:

A quasi-experimental study design was utilized in this study.

#### Setting:

This study was performed at the medicine and rheumatology outpatient clinics in Bab El Shaeria University Hospital, which is affiliated to Al-Azhar University, in Cairo Governorate, Egypt.

#### Subjects:

A purposive sample of 90 patients, diagnosed with systemic lupus erythematosus, was selected, based on the

following inclusion criteria:

- Patient age ranges from 20 to 55 years from both sexes
- Patient should have smart phone, basic familiarity with the usage of telephone, sending and receiving a short message
- Availability of mobile phone network in patient' s area
- Patient should be able to read, write and communicate with the researchers.
- Patient who is willing to participate in the study

#### **Sample size:**

The sample size can be calculated using the following formula:

$$n = [2(Z_{\alpha/2} + Z_{\beta})^2 \times p(1-p)] / (p_1 - p_2)^2$$
 where, p = pooled proportion obtained from previous study; p<sub>1</sub>-p<sub>2</sub> = difference in proportion of events obtained from previous study; , Z<sub>α/2</sub> (=1.96, for 5% level of significance) and Z<sub>β</sub> (equal 0.84 for 80% power of study). Therefore, n= [2(1.96 + 0.84)<sup>2</sup> × 0.34 × (1-0.34)]/(0.198)<sup>2</sup>=89.7, accordingly, based on the above formula the sample size required is 90.

#### **Tools of Data Collection:**

##### **Tool I: A structured designed interview**

Designed by the researchers after reviewing of previous and recent available related literatures, it was written in simple Arabic language to collect the required data and comprises the following:

**Part one:** Demographic characteristics of studied patient which includes age, gender, marital status, level of education, occupation, and monthly income.

**Part two:** Knowledge of studied patient about systemic lupus erythematosus. It consists of 10 questions to assess the knowledge about systemic lupus erythematosus which includes meaning, types of lupus, signs and symptoms, risk factors, high risk group, complications, diagnostic test, importance of nutrition for

SLE, healthy lifestyle to management and methods of treatment of SLE. The answers were scored based on the level of knowledge of the studied subjects. Each question had 3 responses: complete correct answer (2 scores), incomplete answer (1score) and incorrect answer or don't know (0). The higher score indicates a greater level of knowledge. Patients' answers were compared with a model key answer.

#### **Scoring system:**

Knowledge answers were classified into three categories:

- Poor knowledge that represents < 50% scored from (0-< 10)
- Fair knowledge from 50-< 75% scored from (10 - < 15).
- Good knowledge ≥ 75% scored from (15 - 20).

#### **Tool II. Attitude of studied patient regarding systemic lupus erythematosus:**

It was adopted from Essi and Oudou<sup>(19)</sup> and modified by the researchers. It consisted of 10 statements. It was a 3-point scale as follows: agree, neutral and disagree and scored as follows: agree (3scores), neutral (2scores) and disagree (1score) and total scores of these questions ranged from (10-30) and were categorized as follows:

- Negative attitude (<60%) (with scores ranged from 10- <18).
- Positive attitude (≥60%) (with scores ranged from 18-30).

#### **Tool III. Reported practices of studied patient regarding systemic lupus erythematosus:**

it was adopted from health wise staff<sup>(20)</sup>. It was a 3- point Likert scale as follows: Never (1), Sometimes (2) and Always (3). It consists of 12 questions such as: (take care of skin frequently, eat a healthy balanced diet that includes whole grains, dairy, fruits and vegetables, get regular eye examinations especially funduscopic exam, get regular oral and dental examinations, stay

out of the sun, exercise regularly, reduce stress, tiredness and get plenty of rest, take medications exactly as prescribed and follow-up to doctor constantly.

Total scores of these questions ranged from (12-36) and were categorized as follows:

1. Inadequate practice (<60%) (with scores ranged from 12- < 22).
2. Adequate practice ( $\geq$ 60%) (with scores ranged from 22-36).

#### **Data collection procedures:**

##### **Study Period:**

The actual fieldwork was carried out from beginning of October 2021 to beginning of March 2022, over a period of six months in the previously mentioned setting. The time spent to fill in the questionnaire was 20-30 minutes. The researchers visited the study setting two days/week (Wednesdays & Thursdays) from 10.00 a.m. to 2.00 p.m. The researchers implemented the program by using mobile and making group on what's App included studied patients, also used Yahoo application because it is a safe way to preserve, send and retrieve information when you need it.

##### **Approval:**

An official letter was addressed to the Director of the previously mentioned hospital. The researchers explained the purpose and benefits of this study. The director was informed about the study title, aim, time and date of data collection.

##### **Ethical considerations:**

Official approval was obtained from the Faculty of Nursing. Then, it was sent to the director of the mentioned hospital. The researchers explained the purpose and benefits of this study to the studied sample who agreed to participate in the study. Oral consent was obtained from them before data collection. They were assured that all the collected data will be used for research purpose only. Participants' anonymity,

confidentiality, privacy, safety, and protection were secured.

##### **Tool development:**

###### **Validity:**

Tools were tested for content validity by a jury of 5 experts in the Community Health Nursing field and Medical Surgical Nursing to confirm the consequence and comprehensiveness of the tools.

###### **Reliability:**

Reliability coefficients were calculated for the questionnaires of patients about SLE, Cronbach's Alpha was 0.89 for patients' knowledge, while it was 0.91 for patients' attitudes, and was 0.94 for reported practices of patients toward systemic lupus erythematosus.

###### **- Pilot study:**

A pilot study was carried out on 10% (9) of patients to evaluate tools for clarity, applicability and to estimate the time required for filling in the tools before starting the actual data collection. Data obtained from the pilot study were analyzed and the necessary modifications and rearrangements of the study tools, items were done. Participants in the pilot study were excluded from the main study sample. Construction of Tele-nursing Instructions for patients about systemic lupus erythematosus includes the following:

-At the beginning of the interview, the researchers greeted patients, introduced themselves to each one included in the study. This phase covered interviewing the studied sample to collect baseline data. The pretest interview was implemented to identify the patient's knowledge, attitudes and reported practices about systemic lupus erythematosus.

-Tele- nursing Instructions for patients about SLE was developed based on the findings of the assessment and in the light of related literatures. The knowledge regarding SLE included meaning, types, signs and symptoms

of lupus, risk factors, high risk group, complications, diagnostic test, importance of nutrition for SLE, healthy lifestyle to management of SLE and methods of treatment for SLE. Important practices about SLE were designed to improve patients' practices regarding SLE.

- The researchers implemented tele-nursing instructions followed by the immediate post-test, which lasted over a period of 6 months; by sending 30 messages for theoretical knowledge and 5 videos about practices of SLE to each patient via mobile, using simple and clear language to be appropriate with all studied patients' levels of education.

Different teaching methods were used including videos, pictures through mobile by making a group on What's App to provide all studied sample by messages and designing an illustrated booklet. In addition, more contact was done between the researchers and all studied patients to exchange questions, experiences between groups and to determine the effect of the messages and videos on patients' knowledge and practices.

**The booklet included:** Meaning of SLE, types of lupus, signs and symptoms, risk factors, high risk group, complications, diagnostic test, importance of nutrition for SLE, healthy lifestyle to management of SLE and methods of treatment of SLE and important practices regarding systemic lupus erythematosus.

- **Evaluation:** It was emphasized on estimating the effect of the tele nursing instructions immediately after its implementation by using the same preprogram tools.

#### **Statistical analysis:**

Data entry and analysis were done using the Statistical Package for the Social Sciences (SPSS), version 23 and state graphics statistical software packages. Data were presented using descriptive statistics in the form of frequencies and percentages. Quantitative data were presented in the form of mean  $\pm$  SD.

Qualitative variables were compared using Chi-square test ( $\chi^2$ ) to compare between 2 qualitative variables. Statistical significance was considered at p-value  $<0.05$ .

#### **Results**

**Table (1):** Displays demographic characteristics of the study sample. It shows that 53.3% of studied sample, their age ranged between 20 -< 35, years with a mean of  $36.4 \pm 8.7$  years. Regarding gender, 90.0% were females and 78.9% of them were married. Concerning level of education, 52.2% of them had secondary education, and 42.2% of the sample was employed. In relation to monthly income, for 45.6% of the patients under study, it was insufficient.

**Table (2):** Shows the studied sample knowledge related to SLE at pre and post tele nursing instructions. It demonstrates that, highly statistically significant improvements were found in knowledge of the studied sample between pre/post tele nursing instructions at all items of knowledge ( $p < 0.001$ ).

**Figure (1):** Clarifies that highly statistically significant improvement was found among the studied patients pre/post tele nursing instructions in total knowledge scores about systemic lupus erythematosus, where 67.3% had poor knowledge scores at pre-tele nursing instructions, which improved to 86.2% had good knowledge scores at post tele nursing instructions. The difference among pre and post was a highly statistically significant difference ( $\chi^2 = 97.465$ ,  $p < 0.001$ ).

**Table (3):** Presents the studied sample attitude related to systemic lupus erythematosus at pre and post tele nursing instructions. It demonstrates that, highly statistically significant improvements were found in attitude of the studied sample between pre/post tele nursing instructions at all items of attitude ( $p < 0.001$ ).

**Figure (2):** Reveals highly statistically significant improvement found among the studied patients pre/post tele nursing instructions in total attitude scores, where 38.3% had positive attitude at pre tele nursing instructions, which improved to 82.7% had positive attitude at post tele nursing instructions. The difference among pre and post was a highly statistically significant difference ( $\chi^2=37.037$ ,  $p < 0.001$ ).

**Table (4):** Presents the studied sample reported practices related to systemic lupus erythematosus at pre and post tele nursing instructions, it demonstrates that, highly statistically significant improvements were found in reported practices of the studied sample between pre/post tele nursing instructions at all items of reported practices ( $p < 0.001$ ).

**Figure (3):** Clarifies that there is a statistically significant improvement found among the studied patients pre/post tele nursing instructions in total reported practices scores, where 41.6% had adequate reported practices at pre tele nursing instructions, which improved to 85.6% had adequate reported practices at post tele nursing

instructions. The difference among pre and post was a highly statistically significant difference ( $\chi^2=38.277$ ,  $p < 0.001$ ).

**Table (5):** Points out that there is a statistically significant correlation between total knowledge scores and total attitude scores ( $r=0.253$  at  $p= 0.016$ ). As well, there is a statistically significant correlation between total knowledge scores and total reported practice scores ( $r=0.261$  at  $p= 0.013$ ) of studied sample at post tele nursing instructions.

**Table (6):** Indicates that there is a statistically significant correlation between total reported practice scores and total attitude scores of studied sample at post tele nursing instructions ( $r=0.274$  at  $p= 0.009$ ).

**Table (7):** Demonstrates relationships between total knowledge scores, total attitude scores, total reported practice scores and demographic characteristics of studied sample at post tele nursing instructions. The study shows that there were significant either or highly significant relationships between knowledge, total attitude and total reported practice scores of studied patients with their age, gender, educational level and monthly income.



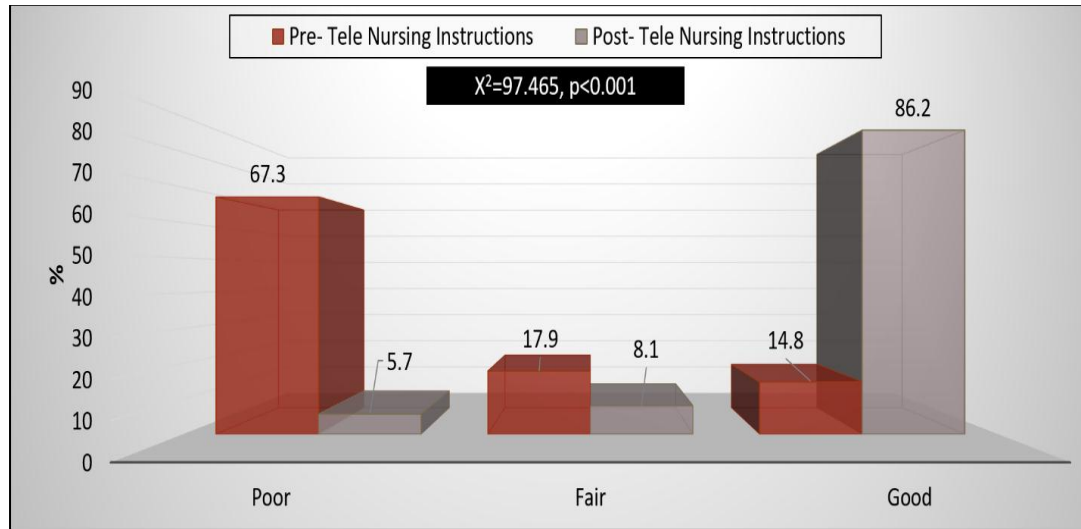
**Table (1):** Frequency Distribution of Demographic Characteristics for Studied Patients (n=90)

<b>Demographic characteristics</b>	<b>No.</b>	<b>%</b>
<b>Age (years)</b>		
20 -< 35	48	53.3
35 -< 45	25	27.8
45 – 55	17	18.9
<b>Mean ±SD</b>	36.4 ±8.7	
<b>Gender</b>		
Female	81	90.0
Male	9	10.0
<b>Marital Status</b>		
Single	9	10.0
Married	71	78.9
Divorced	8	8.9
Widowed	2	2.2
<b>Level of education</b>		
Basic education	13	14.4
Secondary education	47	52.2
University education	23	25.6
Above university education	7	7.8
<b>Residence</b>		
Rural	27	30.0
Urban	63	70.0
<b>Occupation</b>		
Employed	38	42.2
Unemployed	52	57.8
<b>Monthly income</b>		
Insufficient	41	45.6
Sufficient	36	40.0
Sufficient and save	13	14.4

**Table (2):** Knowledge of Studied Sample about Systemic Lupus Erythematosus at Pre and Post Tele Nursing Instructions (n =90)

Items of knowledge	Pre-tele nursing instructions						Post-tele nursing instructions						X <sup>2</sup>	P
	Complete answer		Incomplete answer		Incorrect answer/ don't know		Complete answer		Incomplete- answer		Incorrect answer/ don't know			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Meaning of systemic lupus erythematosus (SLE)	28	31.1	50	55.6	12	13.3	67	74.4	16	17.8	7	7.8	34.841	<0.001**
Types of lupus	15	16.7	44	48.9	31	34.4	55	61.1	22	24.4	13	14.4	37.554	<0.001**
Signs& Symptoms of SLE	31	34.4	43	47.8	16	17.8	57	63.3	27	30.0	6	6.7	15.884	<0.001**
Risk factors for SLE	27	30.0	39	43.3	24	26.7	59	65.6	23	25.6	8	8.9	24.036	<0.001**
High risk group for SLE	24	26.7	37	41.1	29	32.2	63	70.0	21	23.3	6	6.7	37.011	<0.001**
Complications of SLE	23	25.6	36	40.0	31	34.4	65	72.2	19	21.1	6	6.7	42.192	<0.001**
Diagnostic test for SLE	28	31.1	39	43.3	23	25.6	59	65.6	25	27.8	6	6.7	24.074	<0.001**
Importance of nutrition for SLE	29	32.2	38	42.2	23	25.6	58	64.4	25	27.8	7	7.8	20.883	<0.001**
Healthy lifestyle to management of SLE	23	25.6	40	44.4	27	30.0	62	68.9	19	21.1	9	10.0	34.369	<0.001**
Methods of treatment for SLE	27	30.0	41	45.6	22	24.4	64	71.1	18	20.0	8	8.9	30.543	<0.001**

\*\* &lt;0.001, highly significant

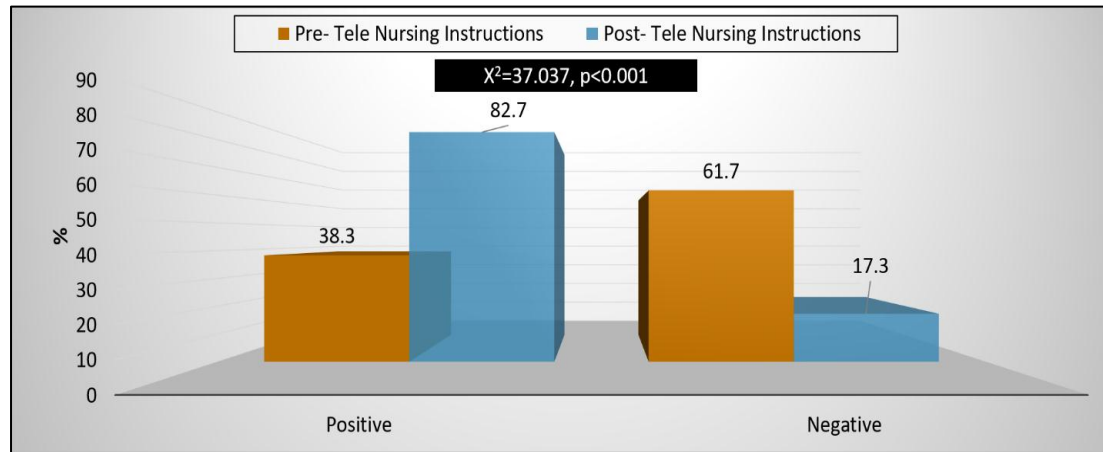


**Figure (1):** Total Knowledge Scores of Studied Sample about Systemic Lupus Erythematosus at Pre and Post Tele Nursing Instructions (n =90)

**Table (3): Attitude of Studied Sample about Systemic Lupus Erythematosus at Pre and Post Tele nursing Instructions (n =90)**

Items of Attitude	Pre-tele nursing instructions						Post- Tele nursing Instructions						X <sup>2</sup>	P
	Agree		Neutral		Disagree		Agree		Neutral		Disagree			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
I am fully informed of my health conditions	25	27.8	18	20.0	47	52.2	67	74.4	9	10.0	14	15.6	40.026	<0.001**
At present, I am still confident in managing my health condition	36	40.0	13	14.4	41	45.6	72	80.0	7	7.8	11	12.2	31.108	<0.001**
A routine follow-up for systemic lupus erythematosus (SLE) every 1 or 2 months would help to stay healthy	31	34.4	22	24.4	37	41.1	63	70.0	4	4.4	23	25.6	26.622	<0.001**
There is a low possibility of developing systemic lupus erythematosus complications in future with follow-up	37	41.1	20	22.2	33	36.7	78	86.7	3	3.3	9	10.0	40.897	<0.001**
It is easy for me to find the time to go to the doctor for systemic lupus erythematosus follow-up	35	38.9	15	16.7	40	44.4	69	76.7	6	6.7	15	16.7	26.336	<0.001**
I am able to choose foods that are best for my health	39	43.3	18	20.0	33	36.7	70	77.8	8	8.9	12	13.3	22.463	<0.001**
I am able to maintain a healthy eating pattern	41	45.6	19	21.1	30	33.3	68	75.6	12	13.3	10	11.1	18.269	<0.001**
I usually unmissed doses of medication for systemic lupus erythematosus disease	37	41.1	13	14.4	40	44.4	73	81.1	9	10.0	8	8.9	33.842	<0.001**
I could exercise at least 3 times a week to improve healthy condition	32	35.6	19	21.1	39	43.3	62	68.9	11	12.2	17	18.9	20.351	<0.001**
My life would be impossible without medication and without medication I become very ill	41	45.6	21	23.3	28	31.1	74	82.2	9	10.0	7	7.8	26.870	<0.001**

\*\* &lt;0.001, highly significant

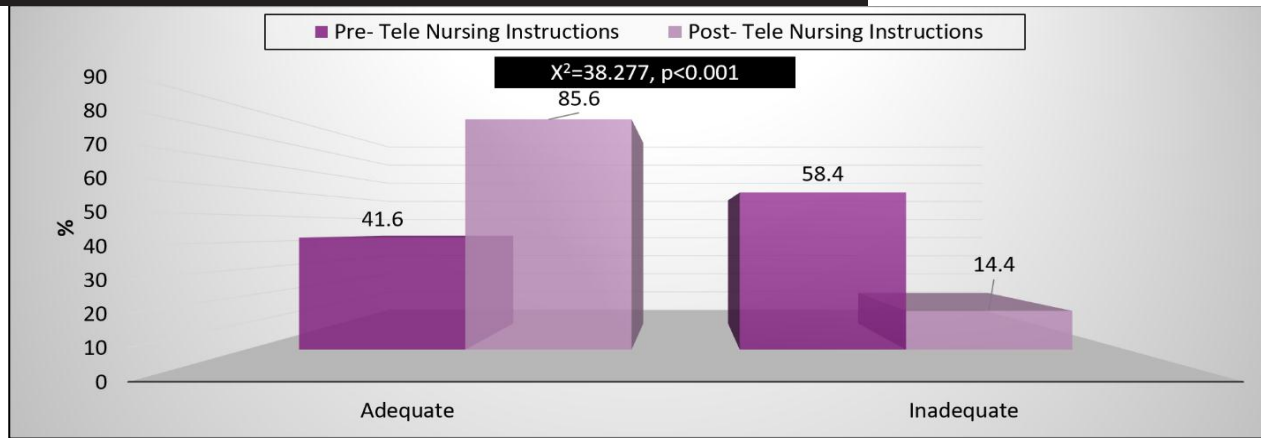


**Figure (2):** Total Attitude Scores of Studied Sample about Systemic Lupus Erythematosus at Pre and Post Tele Nursing Instructions (n =90)

**Table (4):** Reported Practices of Studied Sample about Systemic Lupus Erythematosus at Pre and Post Tele Nursing Instructions (n =90)

Items of reported Practices	Pre-tele nursing instructions						Post-tele nursing instructions						X <sup>2</sup>	P
	Always		Sometimes		Rarely		Always		Sometimes		Rarely			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Take care of skin frequently to prevent rash or scars	34	37.8	18	20.0	38	42.2	68	75.6	4	4.4	18	20.0	27.385	<0.001**
Eat a healthy balanced diet includes whole grains, dairy, fruits and vegetables, and protein	31	34.4	18	20.0	41	45.6	77	85.6	7	7.8	6	6.7	50.496	<0.001**
Get regular eye examinations especially funduscopy exam	30	33.3	16	17.8	44	48.9	78	86.7	11	12.2	1	1.1	63.348	<0.001**
Get regular oral, dental examinations and brush and floss teeth each day	46	51.1	15	16.7	29	32.2	76	84.4	11	12.2	3	3.3	29.117	<0.001**
Stay out of the sun, especially when the sun's rays are the strongest	32	35.6	20	22.2	38	42.2	73	81.1	12	13.3	5	5.6	43.335	<0.001**
If must be in the sun, cover arms and legs and wear a hat	27	30.0	16	17.8	47	52.2	70	77.8	9	10.0	11	12.2	43.367	<0.001**
Make sure to use a broad-spectrum sunscreen that has a sun protection factor (SPF) of 50 or higher	45	50.0	16	17.8	29	32.2	76	84.4	9	10.0	5	5.6	26.843	<0.001**
Exercise regularly	32	35.6	22	24.4	36	40.0	75	83.3	8	8.9	7	7.8	43.372	<0.001**
Reduce stress, tiredness and get plenty of rest	36	40.0	22	24.4	32	35.6	75	83.3	11	12.2	4	4.4	39.147	<0.001**
Take medications exactly as prescribed and follow-up to doctor constantly	42	46.7	17	18.9	31	34.4	77	85.6	5	5.6	8	8.9	30.404	<0.001**
Call doctor line if have any problems with medications.	37	41.1	22	24.4	31	34.4	72	80.0	7	7.8	11	12.2	28.521	<0.001**
Contact doctor line if this symptom happened: aching or swollen joints, increased fatigue, loss of appetite, hair loss, skin rashes, or new sores in your mouth or nose and fever	30	33.3	22	24.4	38	42.2	73	81.1	9	10.0	8	8.9	42.968	<0.001**

\*\* <0.001, highly significant



**Figure (3):** Total Reported Practice Scores of Studied Sample about Systemic Lupus Erythematosus at Pre and Post Tele Nursing Instructions (n =90)

**Table 5:** Correlations between Total Knowledge Scores, Total Attitude Scores and Total Practice Scores of Studied Sample at Post Tele Nursing Instructions (n =90)

Variables	Total knowledge scores						r	p
	Poor (n=5)		Fair (n=7)		Good (n=78)			
	No.	%	No.	%	No.	%		
Positive attitude (74)	3	60.0	3	42.9	68	87.2	0.253	0.016*
Negative attitude (16)	2	40.0	4	57.1	10	12.8		
Adequate practice (n=77)	4	80.0	3	42.9	70	89.7	261	0.013*
Inadequate practice (n=13)	1	20.0	4	57.1	8	10.3		

\* &lt;0.05, significant

**Table 6:** Correlation between Total Practice Scores and Total Attitude Scores of Studied Sample at Post Tele Nursing Instructions (n =90)

Total attitude scores	Total reported practice scores				r	p
	Adequate (n=77)		Inadequate (n=13)			
	No.	%	No.	%		
Positive attitude (n=74)	66	85.7	8	61.5	0.274	0.009*
Negative attitude (n=16)	11	14.3	5	38.5		

\* &lt;0.05, significant



**Table 7:** Relationships Between Total Knowledge Scores, Total Attitude Scores, Total Reported Practice Scores and Demographic Characteristics of Studied Sample at Post Tele Nursing Instructions (n =90)

Demographic characteristics	Total knowledge scores						Total attitude scores				Total Reported Practice Scores			
	Poor (n=5)		Fair (n=7)		Good (n=78)		Positive (n=74)		Negative (n=16)		Adequate (n=77)		Inadequate (n=13)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Age (years)</b>														
20 -< 35	0	00.0	2	28.6	46	59.0	44	59.5	4	25.0	45	58.4	3	23.1
35 -< 45	2	40.0	3	42.9	20	25.6	20	27.0	5	31.3	21	27.3	4	30.8
45 – 55	3	60.0	2	28.6	12	15.4	10	13.5	7	43.8	11	14.3	6	46.2
	X <sup>2</sup> =10.235 P=0.037*						X <sup>2</sup> =9.381 P=0.009*				X <sup>2</sup> =8.637 P=0.013*			
<b>Gender</b>														
Female	3	60.0	5	71.4	73	93.6	69	93.2	12	75.0	72	93.5	9	69.2
Male	2	40.0	2	28.6	5	6.4	5	6.8	4	25.0	5	6.5	4	30.8
	X <sup>2</sup> =8.799 P=0.012*						X <sup>2</sup> =4.865 P=0.027*				X <sup>2</sup> =7.283 P=0.007*			
<b>Marital Status</b>														
Single	0	0.0	3	42.9	6	7.7	7	9.5	2	12.5	8	10.4	1	7.7
Married	4	80.0	4	57.1	63	80.8	59	79.7	12	75.0	60	77.9	11	84.6
Divorced	1	20.0	0	0.0	7	9.0	6	8.1	2	12.5	7	9.1	1	7.7
Widowed	0	0.0	0	0.0	2	2.6	2	2.7	0	0.0	2	2.6	0	.00
	X <sup>2</sup> =0.553 P=0.103						X <sup>2</sup> =0.877 P=0.830				X <sup>2</sup> =0.506 P=0.917			
<b>Level of education</b>														
Basic	3	60.0	1	14.3	9	11.5	11	14.9	2	12.5	13	16.9	0	.00
Secondary	2	40.0	6	85.7	39	50.0	40	54.1	7	43.8	44	57.1	3	23.1

University	0	0.0	0	0.0	23	29.5	23	31.1	0	0.0	20	26.0	3	23.1
Higher	0	0.0	0	0.0	7	9.0	0	0.0	7	43.8	0	.0	7	53.8
	$X^2=13.976$ P=0.029*						$X^2=37.666$ p<0.001**				$X^2=46.164$ p<0.001**			
<b>Residence</b>														
Rural	1	20.0	6	85.7	20	25.6	27	36.5	0	0.0	27	35.1	0	.00
Urban	4	80.0	1	14.3	58	74.4	47	63.5	16	100.0	50	64.9	13	100.0
	$X^2=0.536$ P=0.764						$X^2=0.148$ P=0.928				$X^2=0.148$ P=0.928			
<b>Occupation</b>														
Employed	1	20.0	1	14.3	37	47.4	23	31.1	15	93.8	28	36.4	10	76.9
Unemployed	4	80.0	6	85.7	41	52.6	51	68.9	1	6.3	49	63.6	3	23.1
	$X^2=0.135$ P=0.713						$X^2=0.09$ P=0.764				$X^2=0.08$ P=0.664			
<b>Monthly income</b>														
Insufficient	5	100.0	6	85.7	30	38.5	37	50.0	4	25.0	41	53.2	0	.00
Sufficient	0	0.0	1	14.3	35	44.9	30	40.5	6	37.5	31	40.3	5	38.5
Sufficient and save	0	0.0	0	0.0	13	16.7	7	9.5	6	37.5	5	6.5	8	61.5
	$X^2=12.213$ P=0.015*						$X^2=8.996$ P=0.011*				$X^2=30.262$ p<0.001**			

\* <0.05, significant

\*\* <0.001, highly significant

## Discussion

Systemic lupus erythematosus (SLE), is the most common type of lupus. The SLE is an autoimmune disease in which the immune system attacks its own tissues, causing widespread inflammation and tissue damage in the affected organs. It can affect the joints, skin, brain, lungs, kidneys and blood vessels. The SLE is a chronic disease that can have phases of worsening symptoms that alternate with periods of mild symptoms. Most patients with SLE can live a normal life with treatment <sup>(21)</sup>. So that, the current study was conducted to evaluate the effect of tele nursing instructions on improvement of awareness among systemic lupus erythematosus patients.

Concerning demographic characteristics of studied sample, the present study results revealed that more than half of the studied sample was in the age group of 20-< 35 years with a mean of  $36.4 \pm 8.7$ , most of the sample were female, more than three quarters of sample were married, and more than half of the studied sample had secondary education. In addition, more than two fifths of the sample were employed and had insufficient monthly income (Table1). These study results agree with those of **Hzret et al.** <sup>(22)</sup>, in Iran, whose study entitled "Evaluation of a multidisciplinary patient education program about systemic lupus erythematosus", reported that 85% of the sample were women with a mean age of  $35.7 \pm 9.5$  years, 76.2% of the patients were married, 53.3% of the patients had completed secondary school, 41.3% of the patients were employed and 43.7% of sample had insufficient income. These findings were consistent with those of **Doran et al.** <sup>(23)</sup>, in London, whose study

entitled "Fatigue and activity management education for individuals with systemic lupus erythematosus", found that majority of participants were female and married. As well, these findings were similar to those of **Macejová et al.** <sup>(24)</sup>, in Slovakia, who studied "Systemic lupus erythematosus, disease impact on patients" and they reported that SLE female to male ratio was 9:1. These findings may be due to that this disease is common in young adults and more often affecting women than men.

Regarding knowledge of studied sample about SLE, the present study result showed that highly statistically significant improvements in all items of knowledge at post tele nursing instructions. As well, this study showed highly statistically significant improvements among the studied sample concerning total knowledge scores, the results revealed that more than two thirds had poor knowledge score at pre tele nursing instructions, while at post tele nursing instructions, the majority of them had good knowledge scores about systemic lupus erythematosus. (Table2 and Figure 1).

These previous results are congruent with those of **Bucchiaa nd Launay** <sup>(25)</sup>, in Canada, whose study entitled 'Implementation of a health education program for adults affected by systemic lupus erythematosus', and they found improvement in all items of knowledge after implementation of an education program for their study sample. This result was also in the same line with those of a study done by **Sahebalzamani et al.** <sup>(26)</sup>, in France who studied "Effects of a continuous care model on patients' knowledge and health-related quality of life in systemic lupus erythematosus", they

stated that the program had its impact on improving the level of knowledge about systemic lupus erythematosus among the intervention group than the control group. As well, this study finding is in accordance with those of the study of **Shahdadi et al.** <sup>(27)</sup>, in Iran, whose study entitled "The impact of tele nursing consultation by using the social networks to promote the self-efficacy and knowledge in patients with systemic lupus" and mentioned that a statistically significant improvement was detected between pre and post of.

Telenursing consultation regarding total knowledge scores, which found improvement in total knowledge scores at post. This may be related to that implementation of tele nursing instructions was an effective method for acquiring the study sample with satisfactory knowledge about systemic lupus erythematosus.

Regarding attitude of studied sample, the present study result showed that highly statistically significant improvements in all items of attitude at post tele nursing instructions. As well, this study finding showed statistically significant improvements among the studied sample concerning total attitude scores, the results revealed that more than one third had positive attitude at pre tele nursing instructions, which improved to more than four fifths had positive attitude at post tele nursing instructions regarding systemic lupus erythematosus. These results are congruent with those of **Shahdadi et al.** <sup>(27)</sup>, in Iran, who found statistically significant improvements in all items of attitude regarding systemic lupus erythematosus after the intervention. As well, these study findings agreed with those of **Mostafa and Abd-Elrehem** <sup>(28)</sup>, in Egypt, whose, study entitled "Self-

management guidelines: Effect on awareness of patients with systemic lupus erythematosus", mentioned that a statistically significant improvement was detected between pre and post self-management guidelines regarding total attitude scores. This may be attributed to the positive effect of tele nursing instructions among the studied patients in enhancement of their attitudes regarding systemic lupus erythematosus.

Regarding the self-reported practices, the current study results revealed that highly statistically significant improvements were found in reported practices of the studied patients between pre/post tele nursing instructions at all items of reported practices. As well, this study finding showed a statistically significant improvement detected among the studied patients pre/post tele nursing instructions in total reported practice scores. These findings were in accordance with those of **Mohamed and Kamel** <sup>(29)</sup>, in Egypt, who studied "Effect of health education-based intervention on self-care among systemic lupus erythematosus clients" and found that the success of an intervention can be measured by improvements in ability to perform daily living activities, maintain a healthy diet and exercise regularly as outcome measures. Similarly, these study findings were supported by those of **El-Lateef and Abo-ElNoor** <sup>(30)</sup>, in Egypt, who studied "Effect of nursing education on knowledge and self-care for patients with systemic lupus erythematosus" and reported that there is a statistically significant improvement found among the studied patients pre/post nursing education in total practices related self-care scores. This may be due to the change in patients'

knowledge which reflected on the level of practices regarding systemic lupus erythematosus and effectiveness of tele nursing instructions which improved their practices.

Hence, the research hypotheses (**H<sub>1,2&3</sub>**), which stated that tele nursing instructions will improve studied patients' knowledge, attitudes and self-reported practices about systemic lupus erythematosus were justified.

Regarding the correlation between total knowledge scores and total attitude scores, this study result showed that a positive statistically significant correlation was found between total knowledge scores and total attitude scores of studied patients about systemic lupus erythematosus. This result agreed with that of **Shahdadi et al.** <sup>(27)</sup>, in Iran which revealed that increase in knowledge and improved attitudes regarding systemic lupus erythematosus occurred after tele nursing consultation by using the social networks and positive correlation was found between total knowledge scores and total attitude scores. This finding indicated that information plays a large and effective role in changing attitude.

The results of the current study indicated that there was a positive statistically significant correlation between total knowledge scores and total reported practice scores regarding systemic lupus erythematosus at post tele nursing instructions. This result was in the same line with that of the study done by **El-Lateef and Abo-ElNoor** <sup>(30)</sup>, in Egypt, which reported that an increase in knowledge leads to enhancement in practices. This may be due to that the knowledge plays an important role to promote practices.

Additionally, the present study finding revealed that a positive statistically significant correlation was detected between total attitude scores and total reported practice scores regarding systemic lupus erythematosus at post tele nursing instructions. This result is in accordance with that of a similar study conducted by **Hubner et al.** <sup>(31)</sup>, in China, which reported that differences were observed for pre and post-intervention scores between attitudes and practices and present positive correlation was found between total attitude scores and total practice scores.

Hence, the above-mentioned results proved the research hypothesis (**H<sub>4</sub>**), which revealed that there will be a significant correlation between knowledge, attitude, and practices of studied patients regarding systemic lupus erythematosus at post tele nursing.

Regarding relationships between total knowledge scores, total attitude scores, total reported practice scores and demographic characteristics of studied sample at post tele nursing instructions, the current study findings showed that, there were significant relationships between knowledge, attitude and reported practices with some characteristics of the studied patients such as age, gender, level of education and monthly income. This result was in consistence with that of **Brown et al.** <sup>(32)</sup>, in Brazil, who studied "The health education for lupus patients study: A randomized controlled cognitive behavioral intervention targeting psychosocial adjustment and quality of life in patients with systemic lupus erythematosus", and found significant relationships between age, education level, monthly income and patients' knowledge,

attitudes and practices about systemic lupus erythematosus at post the health education and mentioned that, good knowledge, positive attitudes and satisfactory practices were associated with higher education, young age group and sufficient monthly income. The current study result was also supported by that **Mohamed and Kamel**<sup>(29)</sup>, who stated that statistically significant associations with demographic variables such as patients' education, gender and their age were detected at posttest of knowledge, attitudes, and practices. In addition, **Rinaldi et al.**<sup>(33)</sup> in Italy, who studied "Health-related quality of life in Italian patients with systemic lupus erythematosus. Relationship between knowledge and practices and patients' characteristics ", reported that patient with lower education had lower level of knowledge and practices ( $p < 0.05$ ).

### Conclusion

Patients' knowledge, attitudes and reported practices about SLE improved at post tele nursing instructions than pre, with highly statistically significant differences. In addition, there was a positive statistically significant correlation between total knowledge scores and total reported practice scores. As well, there was a positive statistically significant correlation between total knowledge scores and total attitude scores of studied patients. In addition, there were significant relationships between knowledge, attitudes and reported practices with some characteristics of the studied patients such as age, gender, level of education and monthly income.

### Recommendations

1. Illustrated booklet should be available at outpatient hospital clinics and health

centers for all patients with systemic lupus erythematosus.

2. Periodical follow-up should be carried out to assess health status of patients with systemic lupus erythematosus.
3. Simple educational pamphlets and posters about systemic lupus erythematosus should be provided for all patients in outpatient clinics.
4. Further similar studies should be conducted on a larger sample of patients with different age and regions for generalization of the results.

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