

Effect of Progressive Muscle Relaxation Technique on Quality of Life and Fatigue Severity among Systemic Lupus Erythematosus Patients'

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Abstract

Background: Systemic Lupus Erythematosus (SLE) is a chronic disease that distresses multiple organ systems and roots a broad spectrum of clinical and immunological manifestations. Progressive relaxation exercises showed a great impact on many suffers in both medical and surgical conditions. **Aim:** to determine the effect of progressive muscle relaxation technique on quality of life and fatigue severity among systemic lupus erythematosus patients. **Design:** A quasi experimental research design with a pretest-posttest control group was used. **Setting:** The study was conducted at the Kidney Diseases Outpatient Clinic at the Damanshour Medical National Institute. **Subjects:** A purposive sample of 80 adult patients diagnosed with SLE (40 patients for each group). **Tools:** Three tools were used, Tool (I) "Demographic data structured interview schedule for patients with Systemic Lupus Erythematosus". Tool (II):- "Systemic Lupus Erythematosus Quality of Life Interview questionnaire". (SLEQOLIQ). Tool (III):- Fatigue Severity Scale. **Results:** Approximately two thirds of patients were aged from 30 to 40 years, majority were female, married; secondary educated, manual work and house wife, from rural area with insufficient income. Majority of patients on a state expense for paying treatment, with more than three years disease duration, discover the disease through its manifestations, suffering from CVD, renal failure and anemia as disease complications. It was found a significant difference between the control and study group regarding quality of life dimensions, total quality of life, and fatigue level even after 15 days and 30 days of follow up while there was no significant difference between both groups before intervention. **Conclusion:** The application of the progressive muscle relaxation technique as a complementary therapy for SLE patients is encouraged where the safety, simplicity, and effectiveness of this technique enhance the QOL and decrease fatigue of SLE patients.

Key words: Progressive Muscle Relaxation Technique, Quality of Life, Fatigue Severity, Systemic Lupus Erythematosus.

Introduction:

Within the autoimmune disease, Systemic Lupus Erythematosus (SLE) reflecting immune system dysregulation results in extensive tissue damage and inflammation. Chronicity of the disease leads to inflammation of the skin, joints, kidneys, lungs, nervous system, and other body organs. Most often, Lupus often develops between the ages of 20

and 40, and women are affected ten times more frequently than men. Minority individuals typically have poorer disease activity, more severe clinical symptoms, and more abrupt illness onset. Hispanic, African American, and Asian SLE patients typically have greater haematological, serosal, neurological, and renal symptoms, regardless of age or gender. SLE condition is now incurable.

(Middleton et al., 2018; Lam et al., 2016; Frieri., 2013).

In Egypt, the second most common admitted rheumatologic disease in Rheumatology, Rehabilitation, and Physical Medicine Department, at Assiut University Hospitals is SLE, with 14.3% (Goma et al., 2016). The mortality rate among adult Egyptian patients with SLE is 2.5% and the most commonly involved organs are kidneys as an important cause of death among them (Gheita, et al., 2011).

In systemic lupus erythematosus, the body's immune system attacks its own normal cell tissue with its own antibodies. During these attacks, periods of remission occur in the disease, and treatment-associated damage occurs, for example, valvular heart disease, cognitive dysfunction, vascular necrosis, osteoporosis, and muscle tenderness. These early damages in the long run can cause late damages including infections, atherosclerosis, and malignancies associated with immunosuppressive treatment (Biscetti et al., 2021; Hinkle., 2014).

The management of SLE patients includes pharmacological therapy and lifestyle modifications. SLE pharmacological therapy mainly depends on several traditional medications such as corticosteroids, antimalarials, immunosuppressive drugs, non-steroidal anti-inflammatory drugs, and analgesia. However, this protocol of treatment is rapidly modified due to the advanced treatment of SLE which includes medications specifically designed to interfere with the immunological abnormalities present in SLE. Concerning lifestyle modifications for SLE, they include enough rest, a balanced diet, adequate exercise, smoking cessation, and adequate sunlight exposure (Basta et al., 2020).

Systemic lupus erythematosus as a chronic illness with its general and local manifestations affects a patient's quality of life (QoL) because it is a lifelong disease. According to Youssef., (2021) Quality of life is defined as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and about their goals, expectations, standards and concerns”.

Physical, psychological, social, and occupational aspects of the patient's quality of life can all be negatively impacted by the clinical manifestations of SLE. Where, SLE affects activities of daily living, job performance, career building, and social activities that lead to social isolation and frustration. Also, it affects of human relationships, partnerships, and family life. So patients with SLE can have a significantly lower quality of life compared to others with other chronic diseases (Saletra & Olesińska., 2018).

Furthermore, in SLE, disease-related fatigue is common. It considered multifactorial underlying symptoms in a broad range of chronic conditions. According to Hersche et al., (2022) and Chegeni et al., (2018) fatigue is described as "the difficulty or inability to initiate activity (the subjective sense of weakness); reduced capacity to maintain activity (easy fatigability); or difficulty with concentration, memory, and emotional stability (mental fatigue)". Complex pathophysiological and psychological processes are involved, which are yet poorly understood.

A sort of exercise that involves stretching and relaxation of a large muscle group from the hands to the feet is called the Progressive Muscle Relaxation (PMR) technique. Numerous studies have shown that PMR exercises can reduce the negative effects of stress and anxiety as well as

acute and chronic pain, nausea, and vomiting. They can also improve sleep; lessen exhaustion, and lower blood pressure, heart rate, and muscular tension. progressive muscle relaxation are easy to do, inexpensive, non-invasive, and have no negative side effects. They can be used to enhance quality of life. Additionally, PMR activities improve therapeutic care and foster patient-nurse contact. (El Geziry et al., 2018; Chegeni et al., 2018).

İbrahimoğlu and Kanan (2017) found that progressive relaxation exercises positively affected the vital signs of open heart surgery patients. Progressive relaxation techniques were successful in lowering the fatigue level in dialysis patients, according to **Serin et al. (2020)**. **Chegeni et al. (2018)** and **Kömürkara & Cengiz (2022)** found that patients with chronic obstructive pulmonary disease who also underwent liver transplantation might significantly lessen their degree of fatigue by performing progressive relaxation exercises.

Significance of the study:

Studies conducted on PMR exercise have shown that it is an effective supplementary approach that positively affects the quality of life and plays an important role in reducing fatigue levels in people with chronic diseases. However, there was no study examining its effects on SLE patients. Therefore, this study was conducted to determine the effect of PMR exercises on QoL and fatigue severity among SLE patients, and whether it can be used as a safe and effective method of independent nursing intervention for those patients. So, raising the quality of life of those patients is the ultimate goal of all health interventions. Within this respect, proper management of such problems is needed through interdisciplinary team of medical, psychiatric, and community health nurses.

Aim of the study:

The aim of the study was to determine the effect of progressive muscle relaxation technique on quality of life and fatigue severity among systemic lupus erythematosus patients.

Hypothesis:

H0: Systemic lupus erythematosus patients who practice PMR technique have the same quality of life and fatigue as those who do not practice it.

H1: Systemic lupus erythematosus patients who practice PMR technique have the better quality of life than those who do not practice it.

H2: Systemic lupus erythematosus patients who practice PMR technique have less fatigue than those who do not practice it.

Operational definition:

Progressive muscle relaxation is *defined operationally* as a systemic contraction of every muscle group with an inhale and holding of breath for 2–10 seconds (depending on the patient's tolerance), followed by a deep relaxation of the same muscle group with a slow expiration through pursed lips within 4–10 seconds (depending on the patient's tolerance).

Materials

Research design:

A quasi experimental research design with a pretest-posttest control group was used.

Setting:

The study was conducted at the Kidney Diseases Outpatient Clinic (two days specific for rheumatology disorders; Sunday and Wednesday from 10 a.m to 12 m.d), first floor of the critical medicine building, at the Damamhur Medical National Institute, Damamhur city, El Beheira governorate.

Subjects:

A purposive sample of 80 adult patients diagnosed with systemic lupus erythematosus who attended to the

above mentioned study setting were selected based on the epidemiology information statistical program (**Epi info V7.0**) which was used to estimate the minimum sample size required using the following parameters:

- a) Population size: 150/year
- b) Expected frequency: 50%
- c) Acceptable error: 10%
- d) Confidence coefficient: 99%
- e) Minimum sample size: 79

Patients who fulfilled the following criteria were considered eligible to take part in the study:

- Adult patients age range from 20 to 60 years.
- Patient recently diagnosed with Systemic Lupus Erythematosus (from 1-3 years).
- Able to communicate verbally.
- Exclude the pregnant women as pregnancy health related quality of life may be overlapping with the SLE quality of life.

The selected patients were then split into two equal groups (control and study), each with 40 individuals.

Tools of the study:

Three tools were used, based on reviewing the related literature in order to collect the necessary information

Tool (I) "Demographic data structured interview schedule for patients with Systemic Lupus Erythematosus"

This tool was developed by the researcher after review of related literature (**Gheita et al., 2011; Reis & Costa, 2010; Sliem et al., 2011**). It was used to assess demographic characteristics of patients diagnosed with Systemic Lupus Erythematosus. It includes two parts;

Part I: Demographic data: This part was used to collect patient's personal data regarding: age, sex, level of education, occupation, marital status, area of residence, income adequacy, source of income and treatment payment system if present.

Part II: Patient's clinical data: This part was used to collect patient's clinical data regarding patient's past medical health history as: onset of the disease discovery, disease duration, length of time since diagnosis, appearance of signs and symptoms, associated medical diseases, previous hospitalization from complications of SLE, number of previous hospitalization, previous operations and exposure to radiation. **Furthermore**, patient's present health history as: chief complains, current prescribed medications, side effects of prescribed medications and compliance with medication regimens. **Moreover**, family history as: diabetes, high blood pressure, heart disease, cancer, rheumatoid arthritis and systemic lupus erythematosus.

Tool (II):- "Systemic Lupus Erythematosus Quality of Life Interview Questionnaire".

(SLEQOLIQ) : This tool was developed by **Leong et al., (2005)** to assess the quality of life of SLE patients. Content validity was done and test-retest reliability was done, the coefficient value was 0.83 by Leong et al., (2005). It includes six main categories namely; physical functioning, social and occupational activities, symptoms, treatment, mood and self- image. The categories items assembled into a questionnaire. These categories are:-

1. **Physical functioning:** Included six items namely: walking outdoors on level ground, shopping, turning taps on and off, going to the supermarket, bathing and drying themselves, and walking continuously for 30 minutes.
2. **Social and Occupational activities:** Included nine items namely: work and school performance, interference with the career or education, missing

work or school, relationship with friends and relatives, taking part in sports, sexual activities, taking part in social activities, unable to go out in the sun, and earning/making less money because of having SLE.

3. **SLE symptoms:** Include eight items namely: poor memory, loss of appetite, fatigue, poor concentration, itchy skin, sore mouth, sore painful or stinging skin, and joint pain and swelling.
4. **Treatment:** Included four items namely: fear of needles, dietary restrictions, inconvenience of daily medication, and inconvenience of frequent clinic visits.
5. **Mood:** Included four items namely: self –consciousness, feeling low or down, depression, and anxiety.
6. **Self- image:** Included nine items namely: wishing that other people did not know that I have SLE, being made fun of by my friends and colleagues, low self-esteem, embarrassment about my SLE, concern about the financial burden to my family, concern that medicines do not work, concern about side effects of medicines, fear of receiving bad news from doctors, and consuming more alcohol or tobacco.

The total number of this tool was 40 items. The patient was asked to rate the items as regard to their frequency of occurrence and importance in the past month.

Scoring system:

Each participant response for each item was registered on **three-point different Likert-scale according to the type of statement** that vary from, 1 = very difficult, 2=

moderately difficult, 3= not difficult at all (questions 1-6), the second 1= very troubled, 2= moderately troubled, 3= not troubled at all (questions 7-27), and the last 1= very often, 2= moderately often, 3= not at all (questions 28-40).

All items were formulated in the same direction, with higher scores indicating higher level of quality of life and lower scores indicating lower level of quality of life.

• Accordingly, the maximum total score for patients' quality of life was equal to 120 (40 questions × 3 points= 120) and minimum total score was equal to 40 (40 questions × 1 points= 40).

- Poor quality of life was defined as a score between 40 and 66.
- Fair quality of life was defined as a score between 67 and 93.
- Good quality of life was defined as a score between 94 and 120.

Tool (III):- Fatigue Severity Scale (Hersche et al., 2022; Chegeni et al., 2018):

The Fatigue Severity Scale (FSS) is a method of evaluating the impact of fatigue. The FSS is a short questionnaire that requires the patient to rate their level of fatigue. Nine statements on the FSS questionnaire measure the severity of fatigue symptoms. Each statement should be responded to by selecting a numerical response between 1 and 7, depending on how well it describes the patient's condition over the previous week and how much the patient agrees or disagrees with it.

• A low value (e.g., 1) indicates strong disagreement with the statement, whereas a high value (e.g., 7) indicates strong agreement.

Scoring system:

- Score from 9- 36 indicate no fatigue

- Score from 37- 46 indicate mild fatigue
- Score from 47- 55 indicate moderate fatigue
- Score from 56- 63 indicate severe fatigue

Method:**Approval:**

An official letter was obtained from the Faculty of Nursing; Damanhur University, then it was directed to the director of the outpatient clinic after explanation of the aim of the study, in order to carry out the research.

Tool development:

Demographic data structured interview schedule for patients with Systemic Lupus Erythematosus (**Tool I**) to collect data about the demographic, as well as patient's clinical data was developed by the researcher. Systemic Lupus Erythematosus Quality of Life Interview Questionnaire (SLEQOLIQ) (**Tool II**) was translated into Arabic language by the researcher after review of relevant literature. Tool III was adopted and translated into Arabic.

Testing of content validity: The content validity of the tools was submitted to jury members of five experts in the Medical-Surgical Nursing and community health nursing field, to assure the content validity, completeness, and clarity of items, appropriateness of translations, and applicability on the Egyptian society.

Reliability testing: was done using the test-retest method within three weeks intervals on 8 patients by Alpha Cronbach's for the tool 2, and 3 were $\alpha = 0.905$, $\alpha = 0.855$.

Pilot study: Pilot study was carried out on 8 SLE patients at the previously mentioned study setting to ascertain the clarity and applicability of the study tools and to identify obstacles that may be faced during data collection. They are not included in the actual study subjects. Based on the

findings of the jury's comments and the pilot study, the tool was reviewed. According to statistical analysis, some questions were clarified, others were added and few were omitted.

Data collection: The data collection was initiated covering a period of 6 months (from February 2022 to July 2022).

For the study group:

The researchers interviewed each patient in the study group individually for around 45 minutes. The researchers introduced themselves to the patient and clarified the purpose of the study and then written consent was attained for participation in the study. Throughout this interview tool 1 was used to collect demographic data from the patient.

The patient was instructed to sit down in a comfortable position, close his eyes, and maintain them closed (if possible) until the treatment was complete. The patient was asked to re-demonstrate each phase of the PMR procedure after the researchers had previously demonstrated it, as the following steps:

- The patient was encouraged to take deep breaths and inhale deeply through the nose. As the patient filled his or her body with air, the abdomen rose. Next, slowly exhale through your lips, bringing your navel in towards your spine as you do so. Breathe deeply for 3-5 cycles (or as long as the patient can handle it).
- The patient was told to contract and relax their muscles by the researchers. Starting with your feet, tighten your toes and push your heels down. For a few breaths, squeeze firmly, then let go. Then, flex your feet inward with your toes pointing up towards your head. Hold for 10 seconds, then slowly release as you count to 10.

- Keep tensing and releasing each muscle group. Counting to ten while slowly releasing the contractions in your thigh muscles as you work your way up to your right leg. Repeat for the left leg, buttocks (tighten by pulling buttocks together, holding for 10 seconds, and then slowly releasing while counting to 10), abdomen (tighten by inhaling deeply, holding for 10 seconds, and then gradually releasing while counting to 10), chest (tighten by clenching fist, holding for 10 seconds, and then gradually releasing while counting to 10), hands (tighten fist), and right arm (tighten bicep), for the muscles in the neck and shoulders (raise shoulders up to touch ears, holding for 10 seconds, and then slowly releasing while counting for 10), mouth (open mouth wide enough to stretch the hinges of the jaw, holding for 10 seconds, and then slowly releasing while counting for 10), and finally for the forehead (raise eyebrows as high as possible, holding for 10 seconds, and then slowly releasing while counting for 10).
- The patient exhales deeply as the procedure comes to a close, remarking how much calmer and more at ease they felt.
- According to the patient's needs, the researchers conducted re demonstration. The researchers also corrected the patient's incorrect use of the procedure. The patient was invited to demonstrate the PMR technique again after the explanation was finished until he or she had mastered it.
- The patients then instructed to do PMR technique for two sessions

daily in the morning and evening for one month

- The patients was followed by telephone calling for assuring compliance and outpatients follow up after 2 and 4 weeks
- Tool II and III were completed at the second week and one month post intervention.

For the control group:

- The control group's patients were left for routine care. Each patient underwent a 15-minute individual interview with the researchers, who utilized tools 1, 2, and 3 to obtain information from them. The patient was then interviewed by researchers two weeks and one month later to conduct a post-test using tools 2 and 3.

- Each patient in both groups underwent a private, one-on-one interview to receive written informed consent to participate in the study and to receive an explanation of its aim. Patients were reminded of their ability to refuse study participation, and they were guaranteed of the confidentiality and anonymity of their responses. Additionally, it was guaranteed that they could withdrawal from the study at any time.

Statistical Analysis:

- After data collection was completed, it was feed to SPSS to be analyzed. Data was coded and categorized, number, percentage, mean and stander deviation were used to describe the basic data.

The used tests were:

1 - Chi-square test for categorical variables to compare between different groups

2 - Monte Carlo correction for chi-square when more than 20% of the cells have expected count less than 5.

3 - Student t-test for normally distributed quantitative variables to compare between two studied groups.

4- Mean and Standard Deviation for categorical variables to compare between different groups

Ethical Considerations:

1. Approval of ethical research committee was obtained.
2. Witness/ written informed consent was obtained from patients participating in the study after explanation of the aim of the study.
3. Privacy was ascertained.
4. The anonymity and confidentiality of the collected data for each patient were assured.
5. Each patient had the right to withdraw at any time in the study without any drawbacks.

Results:

Table (1) shows that roughly two-thirds of the study and control groups (60.0% and 67.5%) were between the ages of 30 and 40 years. As regards sex, most of the study subjects (95.0% and 92.5%) in the study and control groups respectively were female. In relation to marital status, less than half (47.5% and 40.0%) of the participants in the study and control groups, respectively, were married. Regarding level of education, it was found that 52.5% and 50.0% of the participants in both the study and control groups, respectively, had completed secondary or technical education. Concerning occupation, it was found that 40.0% and 35.0% of the work in both the study and control groups, respectively, was manual work. Regarding place of residence, it was found that more than half (65.0% and 55.0%) of the participants in both the study and control groups, respectively, were from rural areas. In terms of income sufficiency, 95.0% and 90.0%

of the study and control groups, respectively, had insufficient income. No statistical significance differences were found between the study and control group in relation to demographic characteristics.

Table II: shows that for both the study and control groups, the treatment payment system was 82.5% and 90.0%, respectively. Regarding disease duration, the majority of patients (97.5% and 92.5%, respectively) had disease duration longer than 3 years in both the study and control groups. On the other hand, of the total patients reporting having complications, 40.0% and 30.2% of both groups complained of cardiovascular conditions, and 33.7% of the study group and 27.0% of the control had renal failure and more than one fifth (21.7 and 28.6% respectively) of study and control group had Anemia. Finally, more than two thirds of patients (72.5% and 82.5%) in both the study and control groups had previous hospitalizations for complications. No statistically significant differences were found between the two groups in relation to their demographic and clinical data, which indicated proper matching between the study and control groups in these variables.

Figure I: indicates that all (100.0%) of the patients in the study and control groups had symptoms such as headache, difficulty concentrating, a red malar rash on the face over the cheeks, a nasal bridge, painful, swollen joints, joint movement limitation, sensitivity to the sun, and external fatigue. On the other hand, less than one fifth (12.5%) of patients in the control group had unusual hair loss, compared to more than half (57.5%) of patients with unusual hair loss in the experimental group.

Table III: It was noticed that more than half (55.0% and 57.5%) of the study and control groups had a fair

quality of life, and there was no statistically significant difference between both groups, where $p = 0.786$. After 15 days of practicing the progressive muscle relaxation technique, 87.5% of the study group had a fair quality of life, while 52.5% of the control group had a fair quality of life. There was a statistically significant difference ($P = 0.020^*$) between both groups. After 30 days of practicing the progressive muscle relaxation technique intervention, 55.0% of the study group had a good quality of life compared to only 10.0% of the control group. There was a statistically significant difference between both the study and control groups in the 30 days where $P = 0.000^*$.

Table IV was observed that 7.5% of the study group had mild fatigue before the progressive muscle relaxation technique intervention, while 40.0% of them had mild fatigue in the 15 days after the progressive muscle relaxation technique intervention, and 55.0% of them had mild fatigue after 30 days of the progressive muscle relaxation technique intervention. This compares to the control group (5.0%, 7.5%, and 7.5%), who had mild fatigue prior to intervention, after 15 days, and after 30 days of progressive muscle relaxation technique intervention, respectively. The differences between the study group before and after 15 days and after 30 days of progressive muscle relaxation technique intervention are

statistically significant ($P^{MC} = 0.000$). The same difference in the control group was not statistically significant ($P^{MC} = 0.332$), and the difference between the two groups before the progressive muscle relaxation technique intervention was not significant (0.06). The difference between the two groups after the 15 days of intervention was statistically significant (0.019*). On the other hand, the difference between the two groups after the 30 days of intervention was statistically significant ($P = 0.000^*$).

Table V: It was observed that there was no statistically significant difference between the study and control groups in all dimensions of quality of life before the intervention of the progressive muscle relaxation technique. While there was a statistically significant difference between the study and control groups after 15 days of progressive muscle relaxation technique in physical functioning and social and occupational activities ($p = 0.000$ and $p = 0.002$, respectively), no statistically significant difference was observed between SLE symptoms, treatment, mood, and self-image ($p = 0.555$, 0.328, 0.273, and 0.242, respectively). Moreover, there was a statistically significant difference in all dimensions of quality of life after 30 days of progressive muscle relaxation technique intervention (0.000*, 0.000*, 0.018*, 0.001*, 0.000*, and 0.000*, respectively).

Table (I): Distribution of the Studied Patients according to their Demographic Characteristics.

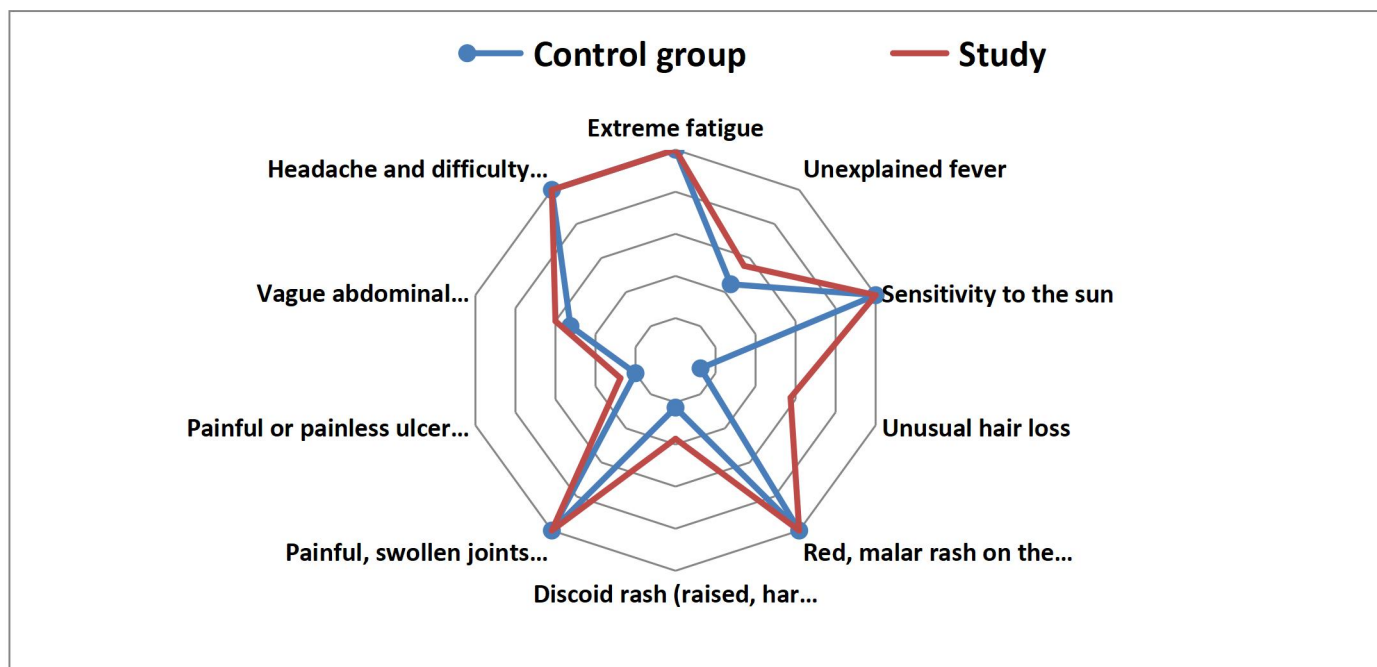
Items	Group type				Total (n=80)		Test of significant X ²
	Study (n=40)		Control (n=40)		No	%	
	No	%	No	%			
Age (in years)							
• 20<30	12	30.0	8	20.0	20	25.0	X²=1.088 P= 0.581
• 30<40	24	60.0	27	67.50	51	63.75	
• 40≤50	4	10.0	5	12.50	9	11.25	
Sex							
• Male	2	5.0	3	7.5	5	6.25	X²=0.213 P=0.649
• Female	38	95.0	37	92.5	75	93.75	
Marital status							
• Single	12	30.0	15	37.5	27	33.75	X²=1.876 P=0.598
• Married	19	47.5	16	40.0	35	43.75	
• Divorced	1	2.5	3	7.5	4	5.0	
• Widowed	8	20.0	6	15.0	14	17.5	
Level of education							
• Illiterate	3	7.5	2	5.0	5	6.25	X²=3.616 P=0.616
• Read & write	2	5.0	0	0.0	2	2.5	
• Primary school education	2	5.0	1	2.5	3	3.75	
• Prep school education	2	5.0	4	10.0	6	7.5	
• Secondary/technical education	21	52.5	20	50.0	41	51.5	
• University education	10	25.0	13	32.5	23	28.75	
Occupation							
• Manual work	16	40.0	14	35.0	30	37.5	X²=1.451 P=0.484
• Housewife	11	27.5	16	40.0	27	33.75	
• Not work	13	32.5	10	25.0	23	28.75	
Place of residence							
• Urban	14	35.0	18	45.0	32	40.0	X²=0.833 P=0.494
• Rural	26	65.0	22	55.0	48	60.0	
Income sufficiency							
• Insufficient	38	95.0	36	90.0	74	92.5	X²= 0.721 P=0.675
• Sufficient	2	5.0	4	10.0	6	7.5	

Table (II): Distribution of the Studied Patients according to their Clinical Data:

Items	Group type				Total (n=80)		Test of significant X ²
	Study (n=40)		Control (n=40)		No	%	
	No	%	No	%			
Treatment payment system							
• Patients expense	7	17.5	4	10.0	11	13.75	X ² = 0.949 P= 0.518
• State expense	33	82.5	36	90.0	69	86.25	
Disease duration							
• Less than 3 years	1	20.5	3	7.5	4	5.0	X ² = 1.053 P= 0.615
• More than 3 years	39	97.5	37	92.5	76	95.0	
Disease diagnosed							
• By sign and symptoms	40	100.0	40	100.0	80	100.0
Complication#							
	N=60		N=63		N=123		X ² =2.848 P=0.583
• Renal failure	20	33.3	17	27.0	37	30.1	
• Stroke	1	1.7	3	4.8	4	3.3	
• Anemia	13	21.7	18	28.6	28	22.8	
• Cardiovascular disease	24	40.0	19	30.2	43	35.0	
• Pneumonia	8	13.3	6	9.2	14	11.4	
Pervious hospitalization from complication							
• Yes	29	72.5	33	82.5	62	77.5	X= 1.147 P= 0.284
• No	11	27.5	7	17.5	18	22.5	

Responses are NOT mutually exclusive.

Figure (1): Distribution of Systemic Lupus Erythematosus Patients according to the Presence of Signs and Symptoms:



the center of the figure represents zero percent

Table (III): Effect of Progressive Muscle Relaxation Technique on the Study and Control Groups' Quality of Life:

Item	Study group (n=40)						Control group (n=40)						X ² (P) Before intervention	X ² (P) after 15 day intervention	X ² (P) after 30 day intervention
	Before		After 15 days		After 30 days		Before		After 15 days		After 30 days				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Levels of quality of life															
• Poor quality of life	17	42.5	3	7.5	2	5.0	15	37.5	15	37.5	16	40.0	0.480 (0.786)	11.277 (0.020*)	23.790 (0.000*)
• Fair quality of life	22	55.0	35	87.5	16	40.0	23	57.5	21	52.5	20	50.0			
• Good quality of life	1	2.5	2	5.0	22	55.0	2	5.0	4	10.0	4	10.0			
X ² (P)	X ² = 83.36 P= 0.000						X ² = 3.100 P= 0.541								

X²= Chi Square test t= t test * Significant p at ≤0.05

Table (IV): Effect of Progressive Muscle Relaxation Technique on the Study and Control Groups' Fatigue Severity :

Item	Study group (n=40)						Control group (n=40)						X ² (P) Before intervention	X ² (P) after 15 day intervention	X ² (P) after 30 day intervention
	Before		After 15 days		After 30 days		Before		After 15 days		After 30 days				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Fatigue Severity															
• No fatigue	0	0.0	0	0.0	3	7.5	0	0.0	0	0.0	0	0.0	11.414 (0.06)	8.556 (0.019*)	35.151 (0.000*)
• Mild fatigue	3	7.5	16	40.0	22	55.0	2	5.0	3	7.5	3	7.5			
• Moderate fatigue	25	62.5	20	50.0	12	30.0	21	52.5	19	47.0	18	45.0			
• Sever fatigue	12	30.0	4	10.0	3	7.5	17	42.5	18	45.0	19	47.5			
MC (P)	P ^{MC} = 0.000						P ^{MC} = 0.332								

X²= Chi-Square test P^{MC}= Monte Carlo test *Significant at P ≤ 0.05

Table V: Effect of Progressive Muscle Relaxation Technique on the Study and Control Groups' Different Domains of Quality of Life:

Dimensions of quality of life	Before intervention		After 15 day of intervention		After 30 days of intervention	
	Study group	Control group	Study group	Control group	Study group	Control group
• Physical functioning	8.35±1.732	8.025±1.073	14.10±1.316	8.61±0.877	15.95±1.218	8.92±0.720
	t= 0.479	P= 0.368	t=68.102	P=0.000	t=31.476	P=0.000
• Social and Occupational activities	12.65±2.190	12.50±2.57	19.80±3.24	17.28±3.59	19.85±4.16	17.00±2.56
	t=0.581	P=0.780	t=3.26	P=0.002	t=3.695	P=0.000
• SLE Symptoms	15.325±3.95	14.10±2.01	15.82±3.40	15.30±4.450	17.40±3.24	15.30±4.45
	t=1.74	P=0.086	t=0.593	P=0.555	t=2.413	P=0.018
• Treatment	6.40±1.19	6.40±1.10	8.205±1.56	7.65±1.83	9.32±2.15	7.80±1.84
	t=0.000	P=1.00	t=0.985	P=0.328	t=3.404	P=0.001
• Mood	8.45±1.35	7.97±1.95	8.92±1.92	8.350±2.66	10.750±1.192	8.85±1.67
	t=1.262	P=0.211	t=1.106	P=0.273	t=5.84	P=0.000
• Self- image	8.45±1.35	7.97±1.95	17.67±3.51	16.70±3.87	24.27±2.38	17.50±3.4
	t=0.398	P=0.692	t=1.79	P=0.242	t=10.30	P=0.000

t= T test *Significant at $P \leq 0.05$

Discussion:

Systemic lupus erythematosus (SLE) is a chronic disease that affects multiple organ systems and causes a broad spectrum of clinical and immunological manifestations (Olesińska & Saletra, 2018). These manifestations not only influence patients' general health, but also have serious impact on household responsibilities, parenting roles, activities of daily living over time, especially regarding family, social or recreational events, work performance, scholastic achievement and quality of life. (Aranow, Diamond & Mackay, 2019). Furthermore, SLE patients face many challenges from the disease itself; multiple types of medications are prescribed to control the disease activity besides its harmful side effects. In addition; the negative physical and psychological impact of SLE is exacerbated by the disease's unpredictable course. All of these factors set a responsibility on the nurse to relieve the patient discomfort and increase their QOL with a non-pharmacological way (Youssef (2021).

Among classical therapy options or non-pharmacological modalities is the progressive muscle relaxation technique. It is considered the most applicable maneuver as it's easy to learned and performed. Moreover, PMR is inexpensive, available, self-induced by the patients with no side effects. It also gathering the benefits of deep breathing exercises and relaxation exercises as Yoga with the welfares of muscle activity (Elsayed Rady et al., 2020).

The results of the present study revealed that approximately two thirds of patients were aged from 30 to 40 years of age, majority were female, married secondary educated, manual work and house wife, from rural area with insufficient income. This was congruent with Brailovski et al, (2019)

results as half of the patients were married, females, two-thirds of them were diagnosed between ages 31 and 44, and few male patients were involved in the study because SLE is a female-predominant disease. In addition, Boedecker et al (2020) who confirmed that nearly 90% of patients with systemic lupus erythematosus are females.

The majority of patients were on a state expense for paying treatment because the disease medication cost is highly expensive. Patients, had the disease for more than three years duration, discover the disease through its manifestations, suffering from CVD, renal failure, and anemia as disease complications. In the context of the current study findings, (Aringer et al., 2019) found that Long-term use of drugs and the inflammatory potential of the disease itself cause a host of comorbidities such as cardiovascular disease, end-stage renal failure, or osteoporosis. Also, (Fanouriakis et al., 2019) findings have shown that cardiovascular disease is the main risk factor for increased death and organ damage among SLE patients.

In addition, the majority of studied patients were previously hospitalized, all of them suffering from fatigue, sun sensitivity, malar rash, painful swollen joints, headache and difficult concentration. This result was in the same line with Leuchten et al (2018) who reported that (89.4%, 86.7%, 79.4%, 76.1%, 66.1%, 33.0% respectively) suffering for fatigue, joint pain, photosensitivity, myalgia, skin and renal involvement. While, these results contradict Cojocar, et al (2011) who found in their study that SLE symptoms vary from one patient to another either mild, moderate, or severe. It may come and go, depending on which body part is affected.

This was harmonious with study results that Youssef (2021)

conducted to compare the effect of strengthening exercises on depression, fatigue and quality of life in both SLE and sedentary subjects. It found that SLE has reduced exercise capacity due to fatigue, depression and drugs associated with several complications arising from disease progression. This leads to lower fitness levels, reduced exercise capacity, reduced muscle strength, greater disability, decreased quality of life and increased social dependence when compared to sedentary controls.

Concerning the impact of progressive muscle relaxation technique, it was found a significant difference between the study and control group regarding quality of life dimensions, total quality of life, and fatigue level even after 15 days and 30 days of follow up while there was no significant difference between both groups before intervention. This may be owed to that patients in the both groups are quietly similar in their demographic and disease characteristics.

It is known that patients with SLE have an autonomic dysfunction, especially decreased parasympathetic function mainly the vagus nerve that controls visceral functions. (Liboriussen et al., 2022). Vagus nerve stimulation can be performed through physiological methods such as deep breathing, which is an essential part of progressive muscle relaxation technique, yoga, or meditation. As deep breathing make the vagus nerve stimulated through the baroreflex. When blood pressure increases, the arterial baroreceptors are activated which in turn activates of the vagus nerve, that direct the vagus nerve signals to the sinoatrial node in the heart, resulting in decreased heart rate (Bonaz et al., 2016; Yap et al., 2020; Roving et al., 2021).

These results was in the same line with the study finding as the study group patients showing a great improvement in the physical and mood domains of quality of life. As well as, (Roving et al., 2021) reported that the progressive muscle relaxation technique enhance decreasing muscle tension, lowering anxiety level by distracting attention, reducing fatigue levels, improving sleep quality, physical fitness, mood, and QOL.

As the study results showed a positive impact of PMR on mood and self-imaging dimensions. The reasons for this consistency in results can be attributed to the fact that progressive muscle relaxation increases the self-esteem of patients with chronic diseases and enhances the patients' internal control power and increases their cognitive abilities (Aarabi et al., 2018). Furthermore, Akbari et al (2022) refined that complementary therapies, such as progressive muscle relaxation techniques, have many physical and psychological effects and promote the self-care, emotion, and spirituality, resulting in the promotion of self-esteem in chronic patients.

Moreover, progressive muscle relaxation, are thought to affect the pituitary - adrenal axis of the hypothalamus, preventing overproduction of cortisol and improving mood, resulting in a relaxing response. It acts as a neuroendocrine mediator in neural circuits, which are responsible for regulating mood and emotion (Masmouei et al., 2019).

The finding of the present study also supported by Izgu et al., (2020) who examine the effects of progressive muscle relaxation and mindfulness meditation on the severity of diabetic peripheral neuropathic pain (DPNP), fatigue, and quality of life in patients with type 2 diabetes. They found that

both progressive muscle relaxation and mindfulness meditation had a positive impact on providing pain relief and fatigue in patients with DPNP. In addition, **Ebrahem & Masry (2017)** found a positive impact of relaxation therapy on depression, anxiety, stress and quality of life among diabetic patients. **Boedecker et al (2020)** added that exercises can serve as helpful means of treatment that reduce fatigue, depression, improve exercise capacity, decrease weight and improve quality of life.

All in all, the study results reject zero hypotheses and support the first and second study hypotheses as systemic lupus erythematosus patients who practice PMR technique have the better quality of life and less fatigue than those who do not practice.

Conclusion and recommendations:

The study results concluded that there were significant differences between the study and control group regarding quality of life dimensions, total quality of life, and fatigue level even after 15 days and 30 days of follow up while there was no significant difference between both groups before intervention. This may be owed to that patients in both groups are quietly similar in their demographic and disease characteristics. The application of the progressive muscle relaxation technique as a complementary therapy for SLE patients is encouraged where the safety, simplicity, and effectiveness of this technique enhance the QOL and decrease fatigue of SLE patients.

Nurses should be undergoing special training programs to educate SLE patients about progressive relaxation technique that often preferred because it is noninvasive effective methods with fewer adverse events, financial costs, and easy transferability into clinical practice. As

well as enable patients to gain beneficial effects on SLE patients' quality of life and fatigue. Future studies with a larger sample size and long-term follow-up are warranted to support the findings of this study.

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