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Impact of Preconception Evidence Based Nursing Guideline on Pregnancy Outcome for Systemic Lupus Erythematosus Women

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Abstract: Systemic lupus erythematosus (SLE) is an autoimmune disease, primarily affecting young females. Pregnancy in a woman with SLE endures a high-risk situation with increased incidence of maternal and fetal mortality and morbidity. Aim of the study was to evaluate the impact of preconception evidence based nursing guideline on pregnancy outcome for SLE women. A quasi experimental design was utilized to conduct this study. This study was conducted at Rheumatology, Immunology and antenatal clinic for high risk group in addition to labor room at Ain Shams Maternity University Hospital. A purposive sample of 83 women diagnosed with SLE (included 35 pregnant women control group and48 women (study group) but only 28 women succeeded to get pregnancy and reach delivery phase) were recruited for conducting this study. Six tools were used for data collection named Arabic structured interviewing questionnaire, follow up diary, pregnancy health record, lupus Activity Index- Pregnancy (LAI-P), modified WHO partogram and Apgar score. Results: showed that there is a high statistical significant improvement in women's knowledge regarding SLE and statistical significant improvement on adherence to lupus medication administration after implementation of guideline. Moreover, there is a statistical significant decrease in degree of generalize pain and a highly statistically significant decrease in the mean score of SLEDAI after implementation of guideline. Pregnancy outcome revealed that maternal complications for control group were abortion, pre-eclampsia, PROM and gestational diabetes that represent 34.8, 13.1, 21.7 and 8.7% respectively. While, pre-eclampsia, PROM and gestational diabetes were maternal complications in the study group that represent 3.6%, 7.2% and 3.6% respectively. Concerning fetal outcome there was improvement in fetal outcome in the intervention group compared to control group. In addition 82.1% of the intervention group versus 22.7% of control group had a full term neonate. Concerning birth weight 71.4 % of the intervention group compared to 13.6% of the control group had neonate with normal birth weight. Conclusion: The implementation of preconception evidence based nursing guideline has a statistically significant positive effect on improving pregnancy outcome for women with SLE. Recommendations: Application of preconception evidence based nursing guideline for SLE women who planned to pregnancy at rheumatology, immunology clinics at Ain Shams University Hospitals.

Key words: Preconception · Evidence Based Nursing Guideline · Pregnancy Outcome · Systemic Lupus Erythematosus

INTRODUCTION

Systemic lupus erythematosus (SLE) is a chronic inflammatory disease that can affect various organs of the body; it is multisystem autoimmune chronic disease with a complex pathogenesis resulting in abnormal immune response mainly affecting women, particularly in reproductive age. SLE provides challenges in the preconception, pregnancy, labor and postpartum periods for these women and for health care team who provide

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their care [1]. It can vary from mild to severe life-threatening. SLE presents with a diversity of symptoms including rash, arthritis, anemia, thrombocytopenia, serositis, nephritis seizures and/or psychosis [2].

The effect of pregnancy on SLE activity has been discussed in majority of studies as pregnancy increases disease activity. In some patients, a great aggravate of symptoms that can be life threatening. Most patients, however, will have a modest increase in symptoms making pregnancy uncomfortable but not affecting their long-term survival [3].

Women with SLE often have a flare of symptoms during pregnancy or shortly after delivery. It is sometimes difficult to distinguish between the common discomforts of pregnancy and the symptoms of lupus. Pregnancy discomforts that are similar to those of lupus include fatigue, swelling of the hands, feet, or ankles, joint pain, especially in the low back, shortness of breath, numbness or pain in one or both hands (caused by carpal tunnel syndrome of pregnancy), skin changes (e.g., darkening of facial skin) [4].

Pregnancy complications that occur more commonly in women with SLE include high blood pressure, preeclampsia, preterm delivery, emergency cesarean section, excessive bleeding after delivery, or blood clots in the leg or lung. There is a higher incidence of miscarriage and fetal loss, especially in women with coexisting antiphospholipid syndrome. Infants born to women with SLE have a higher risk of being born prematurely or intrauterine growth restriction (IUGR) and neonatal lupus syndrome [NLS] [5].

Major issue in SLE pregnancy is the risk of disease aggravation. It is generally agreed that pregnancy may produce higher rates of disease flares; widely variable flare rates between 25 and 65% have been reported. Different organ systems may have variable response to pregnancy; musculoskeletal flares are less common, while renal and hematological flares are more common. Majority of the flares in pregnancy are mild to moderate, with only a small percentage of patients developing severe flares [6]. In addition, pregnancy accompanying with disease flares requiring immunosuppressive therapy. Therefore, pregnancies in SLE patients are represented a high risk condition. Maternal health and fetal development should be monitored frequently during pregnancy. The outcomes for both mother and fetus are best when SLE has been under good control for at least six months before pregnancy and when kidney disease is in remission [7].

Women with SLE can have successful pregnancy outcomes, especially when a collaborative approach between the rheumatologist, obstetrician, neonatologist and specialist midwife. Woman's care should include effective pre-pregnancy risk assessment and stratification followed by individually tailored pre-pregnancy counseling [8].

Preconception health (PCH) refers to the health of women of reproductive age [9]. Preconception care aims to improve the health of the future child and to enhance maternal health through risk assessment, health promotion, counseling and interventions. Risk assessment is the systematic identification and evaluation of risk factors for poor pregnancy outcomes. If risks are identified, additional screening, diagnostic tests and specialist consultations may be necessary [10].

Health promotion means informing and educating women on certain health-promotion issues, including folic acid supplementation, avoiding alcohol or tobacco or take drugs without medical prescription and the importance of proper nutrition. Intervention means efforts to modify or eliminate risk factors. Specialist individual preconception care may be offered to women at increased risk of poor pregnancy outcomes, including women with complicated medical, obstetrical, or family histories; those who have chronic diseases and conditions such as SLE [11].

The starting point to manage pregnancy in lupus patient is ideally before the onset of pregnancy. Therefore, preconception counseling represents an opportunity to improve pregnancy outcome in women with SLE. Preconception care includes detail history taking including medical, surgical, genetic, obstetrical and family history as well as thorough physical examination. Complete antibody profile is requested [12].

Nurses play a key role in collaboration between SLE pregnant woman and other members of the multidisciplinary health care team. Nurses even have advanced and extended roles. These include self-management support, patient education and counseling, referral to other health professionals, telephone advices and monitoring disease-modifying and treatments [13]. In addition, nurses should provide care that is based on guidelines according to national and local contexts. Guidelines are essential for all healthcare professionals to ensure safe and high-quality care. It has been demonstrated that structured implementation material supported nurses in the guidance of patients with a complex treatment regimen. Guidelines have been found to support nurses' clinical decision-making skills with regard to assessment and treatment, referral, supplementary prescription and therefore contribute to evidence-based nursing and holistic care [14].

Significance of the Study: Pregnancy in with SLE women is still associated with higher fetal and maternal morbidity and mortality. Optimal management of pregnancy in this setting requires multidisciplinary care with close collaboration between a rheumatologist, an obstetrician and midwife. There is strong evidence that pregnant women with SLE who receive proper management are more favor to have healthy, full-term pregnancies, especially if it combined with pre conception care that pointing to prevent disease complications and save pregnancy outcome through increase women awareness and knowledge regarding disease process, treatment strategies (e.g., drug treatment), self-management strategies (e.g., diet, exercise, weight control, sleep and stress management). Therefore, evidence-based nursing guideline is crucial for successful pregnancy outcome. In Egypt, limited researches are carried out to evaluate the impact of evidence based instructional guideline to improve pregnancy outcome in women with SLE. So, there was an urgent need to conduct this study.

Aim of the Study: To evaluate the impact of evidence based nursing guideline on pregnancy outcome for SLE women through the following:

- Assessment of SLE women knowledge and health before implementation of guideline.
- Implementation of pre-conception evidence-based nursing guideline on women with (SLE).
- Investigation for the impact of pre-conception evidence-based nursing guideline on SLE women knowledge and health.
- Evaluation the effect of pre-conception evidence-based nursing guideline on pregnancy outcome for pregnant women with (SLE).

Research Hypothesis: The current study hypothesized that: implementation of preconception evidence based nursing guideline for women with SLE will be effective on improving pregnancy outcome than SLE pregnant women that receive routine care.

MATERIALS AND METHODS

Research Design: A quasi experimental design was utilized to meet the aim of the study.

Setting: The study was conducted at Rheumatology, Immunology clinics and antenatal clinic for high risk pregnancy in addition to labor room at Ain Shams University hospitals – Cairo –Egypt. This setting was selected due to increase number of flow cases in addition there was no specific clinics for preconception care.

Sample Size, Type and Technique: A purposive sample of 83 women diagnosed with SLE was selected and were divided into two groups. Control group that included (35 pregnant women with SLE) and study group that included (48 SLE women) that received preconception evidence based nursing guideline. Only 28 women succeeded to get pregnancy and reach delivery based on the following inclusion criteria;

- SLE women planning to get pregnancy.
- Woman able to read and write (for study group).
- Woman has inactive stage of SLE at least for six months before getting pregnant.
- Woman free from any chronic disease.

Sample size was calculated according to power analysis equation calculating the flow rate of pregnant women having SLE attended outpatient's clinics at Ain Shams University Hospitals Cairo –Egypt (at year 2012).

Tools for Data Collection: The study data was collected through the following 6 tools:

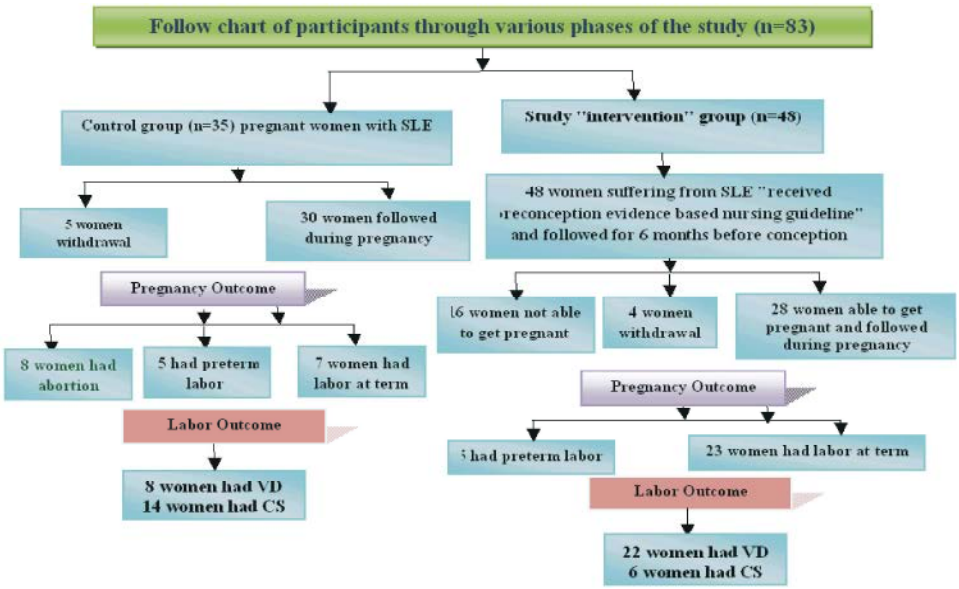
Arabic Structured Interviewing Questionnaire: It includes 5 parts as follows:

Part 1: Socio-demographic data of women: It was used to assess: (age, educational level…etc.).

Part 2: Previous and current obstetric history (gravidity, parity, pregnancy complication…..etc.).

Part 3: History of SLE through (SLE disease activity index [SLEDAI], duration of disease, disease activity, disease complication…etc.).

Part 4: Preconception history: adopted from Barrett *et al.* [15], it was used to assess the preconception health and risk factors for women at reproductive age. It was used at initial assessment to identify potential risk factors for adverse pregnancy outcomes. It consists of 17 items but researcher selected 4 items only as they were consistent with aim of the study "reproductive life plan, chronic medical condition, medications, physical activity, psychosocial stressor".



Part 5: Women knowledge regarding SLE: It was a self-administered test to assess level of knowledge for woman with SLE; it was adopted from Bellotti [16]. The test includes 20 multiple-choice questions related to Systemic Lupus, which was divided into 6 main categories as follow; (1) over view of SLE (concept, main investigation and medication doses, life style changes and complications on body systems). (2) SLE flares (types, signs and symptoms, measures to prevent or control flares, proper management and complications). (3) Preconception care (contraindications for pregnancy, proper time for pregnancy, effect of SLE on pregnancy outcome, safe medication during pregnancy and follow up during pregnancy). (4) Self-care during pregnancy. (5) Proper preparation and management for labor. (6) Proper preparation and management for postpartum in addition to breast-feeding and suitable Family planning methods.

Scoring System: The total score of women knowledge was 40 marks. Each correct answer was given two marks and the incorrect answer was given one. Overall test-retest reliability coefficients were cronbach's alpha values of 0.82.

Follow up diary card: It was adopted from Jolly *et al.* [17]. Lupus patient reported outcome was modified by researchers to monitor women's lupus manifestation, medications, diagnostic measures, pain, vitality and complications through preconception period. Overall test-retest reliability coefficients were cronbach's alpha values of 0.80.

Pregnancy health record: Adopted from Homer *et al.* [18] and modified by researchers. It includes the following 6 items; woman's psychosocial history, physical examination, target weight gain, immunization, medical & obstetric management plan and recommended antenatal schedule for follow up. It was used to assess women's condition through-out pregnancy in both groups (control and study). Overall test-retest reliability coefficients were cronbach's alpha values of 0.82.

Lupus Activity Index- Pregnancy (LAI-P): Adopted from Ruiz-Irastorza *et al.* [19]. It consists of four groups and includes two types of clinical manifestations according to severity, medication and laboratory findings. The total LAI-P score is the mean score of each group, which ranges from 0 to 2.6. Lupus flares are defined as a change in score of 0.25 or greater. Cronbach's alpha revealed an internal reliability of 0.90.

Modified WHO Partogram: Adopted from Gans-Lartey *et al.* [20]. It was a graphical representation of the various events of labor plotted against time. It serves to be a very cost effective and affordable health intervention for monitoring labor and appropriate decision making in addition, to assessment of labor outcome. It was used to assess women condition during labor in both group (control and study). Overall test-retest reliability coefficients were cronbach's alpha values of 0.92.

Apgar score: Adopted from Papile [21]. It was used to assess neonatal condition after delivery. Apgar score is

a quick test performed on a baby at 1 and 5 minutes after birth. Assessment done at one and five minutes after birth and it may be repeated if the score remains low. The five criteria of the Apgar score are: activity, pulse, appearance, grimace and respiration. Each one of these criteria has score ranged from zero to two and then summing up of five criteria was obtained. The resulting Apgar score ranges from zero to 10. Overall test-retest reliability coefficients were cronbach's alpha values of 0.88.

Validity and Reliability of the Tools: Tools were reviewed by a panel of 5 experts in obstetric and gynecological and medical surgical nursing field, rheumatologist and obstetrician to test the face and content validity. Each of the experts was asked to examine tools for content coverage, clarity, wording, length, format and overall appearance. Modifications were done according to the comments "rephrasing and cancelling for eight questions". *Reliability:* Alpha Cronbach test was used to measure the internal consistency of the tools used in the current study.

A Supportive Material Preconception Evidence Based Nursing Guideline for Patients with Systemic Lupus Erythematosus: it was designed and developed by researchers in simple Arabic-language in the light of related literature [7, 13, 14] and then reviewed by a jury of (5) nursing experts and consultants of Rheumatology, obstetrician at Ain Shams University Hospitals. The guideline was divided into 4 parts as follows:

Part One: Concerned with providing the patient with the essential information about concept of SLE, causes, signs and symptoms, diagnostic measures, medications and complications. Part two: Preconception Care including; life style changes, management of common problems of SLE. Part three: precaution measurements for pregnancy with systemic lupus erythematosus. Part four: precaution measurements during labor and immediately after it.

Operational Design: The Operational design includes preparatory phase, pilot study and fieldwork.

Preparatory Phase: This phase was carried out through the following steps:

- Developing the data collection tools after reviewing the recent related literatures in periodicals, internet research and other resources.
- Outlining all areas to be included in the preconception evidence based nursing guideline through extensive review of the literature and other available resources.
- Designing the preconception evidence based nursing guideline for SLE women.
- Experts' opinion were obtained to ensure guideline's validity.
- An official written approval letter clarifying the purpose of the study was obtained from the Dean of Faculty of Nursing of Ain Shams University & director of Ain Shams Maternity University Hospital & director of Rheumatology and immunology clinics of Ain Shams University Hospital as an approval for data collection to conduct this study.

Pilot Study: After the development of tools a pilot study was carried out on 10% of the predicted total sample size (8 women). The purposes of the pilot study were to ascertain the relevance and content validity of tools, estimating the exact time needed for data collection and detect any problem that might face the researchers and interfere with data collection. Tools of data collection took 30-45 minutes to be completed. After conducting the pilot study, the necessary changes were performed; some questions were rephrased, others cancelled, the tools were reconstructed and made ready for use. These females were excluded from the study sample.

Ethical Consideration: The approval was obtained from Scientific Research Ethical committee in Faculty of Nursing at Ain Shams University before starting the study. The researchers introduced themselves to the women who met the inclusion criteria and informed them about the purpose of this study in order to obtain their acceptance to share in this study. The researchers ensured that, the study posed no risk or hazards on their health and their participation in the study is voluntary. Women who were willing to participate in the study and met the inclusion criteria were approached by the researchers and asked for verbal consent to confirm their acceptance, Each participant had right to withdrawal from the study at any time and all data that obtained were considered confidential

Field Work: The data was collected within a period from August 2013 to August 2015 through the following phases:

Phase I (Initial Assessment): The researchers visited the study settings for 3 days per week from 9 am to 2 pm until the end of the pervious predetermined sample size. (One day at obstetric and gynecological outpatient clinics of Ain- Shams University Maternity Hospital (Thursday) to follow-up pregnant women with SLE in control group in addition to follow up of them during labor. Other two days (Sunday & Wednesday) at outpatient rheumatology and immunology clinics of Ain Shams University hospitals to apply the guide line and follow up its effect on (48 women) intervention group's knowledge and health, those days were selected due to increased flow rate of patients at them. The researcher explained to the women the aim of the study , then the oral consent of the woman was obtained. Confidentiality of the information was ensured to gain women confidence and trust. The tools administered by the researcher in time ranging from 35-45 minutes.

- Follow up card was distributed and explained by the researcher among both groups (control & study groups) to record side effects of medication during pregnancy and other warning signs were reported.

Phase II (Implementation):

- This phase was divided into 2 stages, 1st stage implement of the preconception guideline on 48 women of (intervention group) and investigation of the effect of guideline on the women's knowledge and women's health periodically and post –test. While 2nd stage for intervention group started after flare control by six months and involved 28 women only succeeded to get pregnancy and reach delivery phase. At this stage the researchers follow up the pregnancy and labor process of intervention group until 4th stage of labor to assess women condition and newborn through partogram sheet and Apgar score.
- Preconception guideline (educational booklet) was distributed among study group. The instruction was given to each patient individually for 4 sessions each session ranged from 25-35 minutes on individual bases as patients cannot be gathered in the sessions because they didn't come regularly to the unite, also, because each patient was treated as case by case based on the needs of patient.
- The researcher was started with orientation session regarding to contents of the guideline , its purpose and its impact on the patient condition and pregnancy outcome. The researcher gave instructions to patient according to the specific side effects and complication that patient had.
- Each session was started by a summary about what has been discussed in the previous session and the objectives of the new session, using simple Arabic language, also, the session ended by a summary of its contents and feedback from the patients was obtained to ensure that the patients got the maximum benefits. At the end of session the researcher assessed the time and date of next session depend on patient's follow up visit.
- The researchers also communicated with patients via telephone call for instruction and follow up.

Phase III (Outcome Follow-up): Follow-up was conducted via the phone and interview as some of the patients faced difficulty in coming to the hospital due to patients' health condition through the following tool (pregnancy health record). Researchers conduct phone call monthly with each case in the study group to keep patients' reassurance and confirm that women follow the instruction of guideline. This phase was conducted for women in control group at least two times based on gestational age. While, women in the study group who succeed to get pregnancy after implementation of preconception evidence based guideline for six months were interviewed for three times (one time / trimester).

Follow up of SLE Activity: Assessment of SLE activity was obtained from health records of women included in both groups. Before pregnancy, SLE activity was assessed using the SLE disease activity index (SLEDAII). SLE was considered as active if SLEDAII > 4. During pregnancy, the evaluation of lupus flare was based on Lupus Activity Index- Pregnancy (LAI-P) score, which is a validated measurement of disease activity. The LAI-P consists of four groups and includes two types of clinical manifestations according to severity, medication and laboratory findings (Completed blood count, urinalysis, serum albumin, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), serum creatinine, urinary protein, ANA, anti-double-stranded DNA body, anti-Ro/SSA antibody, APLs, anti-Smith antibody and complement C3. The total LAI-P score is the mean score of each group, which ranges from 0 to 2.6. Lupus flares are defined as a change in score of 0.25 or greater. We also used assessed

multi-system manifestations including psychiatric or central nervous system, skin or mucous lesion and polyserositis. In our study, lupus flare wasconsidered if one of the following was present: (1) new onset proteinuria or /and hematuria; (2) psychiatric or central nervous system manifestations (not caused by pre-eclampsia, eclampsia, or HELLP syndrome); (3) Leukocytopenia or thrombocytopenia or Coomb's positive hemolytic anemia; (4) New onset skin or mucous lesion; (5) Polyserositis; (6) Fever > 38.0°C (not caused by infection or drug).

The effect of guideline on patient's condition was assessed through comparing between before and after their knowledge, their health "manifested in lupus activity index", beside self-care practices to overcome side effects of medication and control on SLE flare and pregnancy outcome, the researchers follow the cases through follow up cards and through phone or Mobile application (WhatsApp) after one & three and 6 months from data collection started Follow-up sessions were conducted via the phone as some of the patients faced difficulty in coming to the hospital due to the long distance for giving the patients' reassurance to follow the instruction of guideline.

Phase IV (Evaluation Phase): The evaluation phase was done to determine the impact of preconception evidence based nursing guideline on improving pregnancy outcome for SLE women. Comparison was done between control and study groups using tools from 3 through 6 to investigate study hypothesis.

Statistical Design: The collected data were organized, categorized, tabulated and statistically analyzed using the Statistical Package for Social Science (SPSS 18.0). The statistical analysis includes; percentage (%), mean, standard deviation (SD), Paired T test, Chi square, ANOVA and Fisher's test that were employed to compare quantitative and qualitative variables between the groups, respectively. Also, Alpha Cronbach test was used to test reliability of tools.

RESULTS

Table 1 shows that mean age of the studied women in control group was 27.48±2.5 compared to 28.02±2.89 year of women in the study group, with no statistical significant difference between both groups regarding their other socio-demographic characteristics in addition no statistical significant difference between groups related to disease history due to the mean age at diagnosis of SLE in control group was 18.93±3.56 compared to 19.02±3.58 year of women in the study group. As regard mean duration of SLE in control group was 5.09 ± 3.22 versus 5.06 ± 3.56 year in women of the study group.

Table 2 indicates that there is highly statistical significant improvement in women's knowledge regarding SLE after implementation of guideline.

Table 3 indicates that there was statistical significant improvement on adherence to lupus medication administration from 25% of SLE women in the study group before intervention to 95.8% of them after implementation of guideline by 6 months. In addition there was improvement of vitality, control of pain beside flare control among study group after implementation of guideline by 6 months compared to before intervention. Also Table 4 displays positive changes relevant to laboratory investigations and highly statistical significant difference among SLE women in the study group after implementation of guideline by 6 months compared to them before intervention. Regarding SLEDAI mean score there was highly statistical significant decrease in the mean score after implementation of guideline.

Table 4 reveals that no statistical significant difference between both groups regarding previous obstetric history. Beside the table displays that there were previous pregnancy complications with SLE 33.3% of women in the control group had flare during pregnancy comparing to 20.0% of women in the study group.

Table 5 reveals that all studied women in the study group had planned pregnancy compared to 20.0% of women in the control group. As regard SLE disease activity 63.3% of the studied women in the control group had flare 6 months prior pregnancy compared to none of study group had flare. Concerning adherence to SLE medications and follow up 92.8 and 89.3% 0f the studied women in the study group were committed to SLE medications and follow up compared to 46.6 & 40.0% of women in the control group respectively. As regard SLE disease manifestation SLEDAI mean score was 5.31±2.10 of the studied women in the control group compared to 3.92±0.26 of the studied women in the study group.

Table 1: Distribution of SLE women in (control and study group) according to their socio-demographic characteristics and SLE history

	Control group (n=30)		Study group (n=48)			
Socio-demographic characteristics	No	%	No	%	X^2	P value
Age:	1.432	0.982				
20- ≤ 25	6	20.0	9	18.8		
26- ≤30	16	53.3	26	54.2		
31- ≤ 35	6	20.0	10	20.8		
36- ≤40	2	6.7	3	6.2		
Mean±SD	27.48±2.51		28.02±2.89			
Residence:						
Urban	24	80.0	37	77.1	1.925	0.877
Rural	6	20	11	22.9		
Educational level:						
Read and write	6	20.0	10	20.8	0.067	0.792
Secondary education	20	66.7	32	66.7		
University education	4	13.3	6	12.5		
Occupation:						
Working	4	13.3	7	14.6	1.657	0.582
House wife	26	86.7	41	85.4		
	Control group		Study group			
SLE history	X^-	SD	X^-	SD	T test	P value
Age at diagnosis of SLE	18.93	± 3.56	19.02	± 3.58	0.976	0.0674
Duration of SLE (Year)	5.09	± 3.22	5.06	± 3.56	0.672	0.356

Table 2: Comparison between SLE women's knowledge in the study group before and after implementation of guideline (n=48)

	Before implementation	After implementation Immediately	Follow-up after implementation by 6 months		
Items	Mean ± SD	Mean ± SD	Mean ± SD	F test	P-value
Over view of SLE.	3.36±0.15	5.86±0.75	6.33±1.82	8.80	0.002 **
SLE flares.	4.71± 0.67	6.71±1.43	7.96±1.78	7.65	0.001 **
Preconception care for SLE.	3.57± 0.21	6.57±1.21	7.03±1.42	11.82	0.003 **
Self-care during pregnancy.	4.31±0.08	7.71±1.78	8.56±0.68	8.44	0.002 **
Preparation for labor.	3.08 ±0.03	6.36±0.43	7.25±0.18	9.26	0.002 **
Preparation and management for postpartum period, breast feeding and family planning.	3.11±0.05	6.29±0.56	7.41±0.57	9.04	0.002 **
Total knowledge score	15.04±0.67	22.99±4.52	33.15±2.17	13.80	0.004 **

Minimum knowledge score was 1 while maximum knowledge score was 40.

Table 3: Comparison between pre-conception SLE women's health in the study group before and after implementation of guideline (n=48)

	Before implementation		After implementation by 3 months		Follow up after implementation by 6 months			
Items	No	%	No	%	No	%	X^2	P-value
Adherence to Lupus medication administration	12	25.0	32	66.7	46	95.8	14.35	0.001**
Pain (severe)	32	66.7	20	41.7	10	20.8	14.78	0.001**
Vitality (good)	12	25.0	22	45.8	36	75.0	15.38	0.001**
SLE flare (severe flare)	20	41.7	16	33.3	10	20.8	11.83	0.001**
Laboratory Investigations								
• Anti dsDNA antibodies (high)	20	41.7	15	31.3	5	10.4	10.74	0.001**
• C3 & C4 (low)	11	22.9	5	10.4	1	2.1	8.41	0.001**
• ESR (high)	16	33.3	10	20.8	2	4.2	10.09	0.001**
• ACL antibodies (positive)	8	16.7	5	10.4	2	4.2	11.25	0.001**
• Anti-Ro/SSA (positive)	10	20.8	6	12.5	3	6.3	9.67	0.001**
Item	Mean	SD	Mean	SD	Mean	SD	F test	P value
SLEDAI	7.05	3.96	5.23	2.04	3.92	0.26	26.87	0.001**

SLEDAI =systemic lupus erythematosus disease activity index

Table 4: Comparison between SLE pregnant women in (control and study group) according to their previous obstetric history

	Control group (n=30)		Study group (n=28)			
Items	No	%	No	%	X^2	P value
Gravida:						
Primigravida	8	26.7	7	25.0	0.391	0.568
1- ≤ 2	19	63.3	18	64.3		
3- ≤ 4	3	10.0	3	10.7		
Parity:						
Primipara	15	68.2	14	66.7	0.976	0.829
1- ≤ 2	7	31.8	7	33.3		
Abortion	6	20.0	6	21.4	0.982	0.842
Previous pregnancy with SLE	11	36.7	10	35.7	1.096	0.762
Previous pregnancy complications with SLE @						
Placenta abruption	4	33.3	2	20.0	1.895	0.782
Preeclampsia	6	50.0	4	40.0		
Gestational Diabetes (GDM)	2	16.7	3	30.0		
Flare	4	33.3	2	20.0		

@ Numbers are not mutually exclusive.

Table 5: Comparison between SLE pregnant women in (control and study group) regarding their preconception history

	Control group (n=30)		Study group (n=28)			
Items	No	%	No	%	X^2	P-value
Reproductive life plan						
Planed for pregnancy	6	20.0	28	100.0	18.92	0.001**
Unplanned for pregnancy	24	80.0	0	0.0		
SLE disease activity (6 months prior pregnancy)						
In active	11	36.7	28	100.0	19.45	0.001**
Active (flare)	19	63.3	0	0.0		
Adherence to SLE medications						
Yes	14	46.6	26	92.8	8.33	0.001**
No	16	53.4	2	7.2		
Adherence to SLE Follow up visit						
Yes	12	40.0	25	89.3	16.38	0.001**
No	18	60.0	3	10.7		
Item	Mean	SD	Mean	SD	Independent T test	P value
SLE disease manifestation (SLEDAI)	5.31	2.10	3.92	0.26	7.73	0.04*

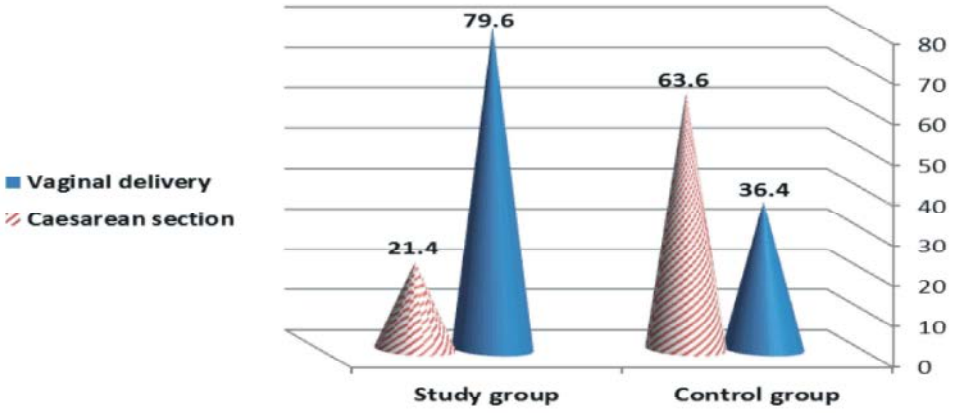


Fig. 1: Comparison between SLE women in (control and study group) according to labor outcome

Table 6: Comparison between SLE women in (control and study group) regarding current pregnancy health (clinical manifestations)

	Control group (n=30)		Study group (n=28)			
Items	No	%	No	%	X^2	P-value
SLE flares during pregnancy						
1st trimester	5	16.7	0	0.0	8.63	0.001**
2nd trimester	7	23.3	1	3.6		
3rd trimester	8	26.7	1	3.6		
Manifestations of flare						
Dermatology (skin rash)	5	16.7	1	3.6	10.72	0.001**
Articular	2	6.7	1	3.6		
Hematological	1	3.3	0	0.0		
Obstetric complications						
1st trimester	5	16.7	0	0.0	9.23	0.001**
2nd trimester	7	23.3	1	3.6		
3rd trimester	11	36.7	3	10.7		
Kind of complications						
Abortion	8	34.8	0	0.0	8.33	0.001**
Pre-eclampsia	3	13.1	1	3.6		
Eclampsia	5	21.7	0	0.0		
PROM	5	21.7	2	7.2		
GDM	2	8.7	1	3.6		
	Mean	SD	Mean	SD	Independent T testItem	P value
LAI-P						
1st trimester	2.1	0.33	1.25	0.45	7.92	0.02*
2nd trimester	2.4	0.68	1.37	0.47	8.46	0.04*
3rd trimester	2.5	0.06	1.44	0.22	8.87	0.04*

LAI-P=Lupus Activity Index- Pregnancy

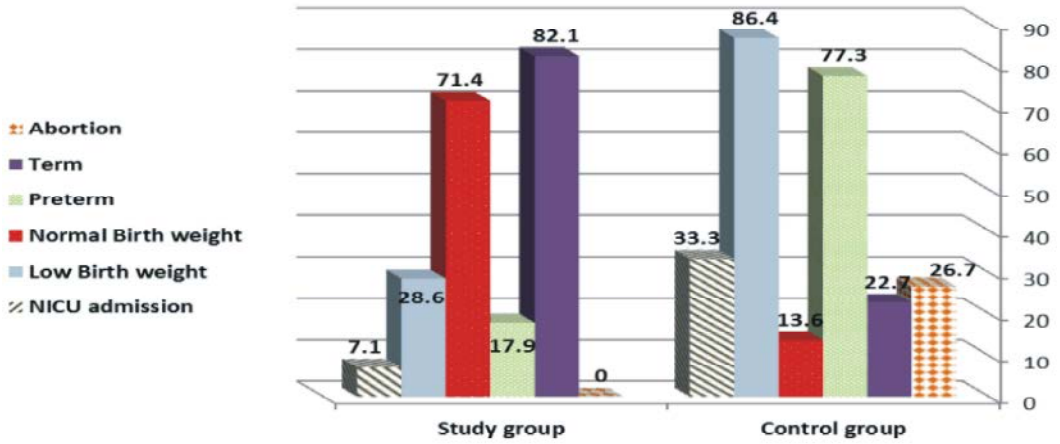


Fig. 2: Comparison between SLE women in (control and study group) according to fetal outcome:

Table 7: Comparison between SLE women in (control and study group) according to neonatal Apgar score

	Control group (n=30)	Study group (n=28)		
Items	Mean ± SD	Mean ± SD	T test	P-value
Apgar Score				
At 1 minute	6.01 ± 0.18	8.24 ± 1.05		
At 5 minutes	6.53 ± 0.75	9.03 ± 0.97	5.67	0.02*

Table 7 reveals that assessment of neonatal condition with Apgar score was higher in the study group compared to control group at 1 and 5 minutes with statistical significant difference.

Table 6 indicates that around quarter of control group versus 3.6% only of the study group had flare in 3rd trimester. Concerning kind of flare 16.7% of the studied women in the control group had dermatological flare as skin rash compared to 3.6% of the study group. Meanwhile, both groups had obstetric complications at 3rd trimester 36.7% for control group versus 10.7% of the study group had complications in current pregnancy. Relating to kind of complications 34.8, 13.1, 21.7, 21.7 and 8.7% of control group had abortion, pre-eclampsia, eclampsia, PROM and gestational diabetes respectively. While 3.6, 7.2 and 3.6% of the study group had pre-eclampsia, PROM and gestational diabetes respectively. Concerning SLE disease activity during pregnancy there was statistical significant difference between both groups as women on the study group had no change of LAI-P score more than 0.25 through pregnancy while, women on the control group had change on score more than 0.25.

DISCUSSION

Pregnancy in women with SLE carries a higher maternal and fetal risk compared with pregnancy in healthy women. The prognosis for both mother and neonate is best when SLE has been controlled for at least six months prior to the pregnancy. Disease flares during SLE pregnancy pose challenges with respect to distinguishing physiologic changes related to pregnancy from disease-related manifestations. Thus, preconception care advocated for SLE control with multidisciplinary approach included medical, obstetric and nurses is necessary to gain favorable pregnancy outcome [22].

Regarding characteristics of SLE women under the study, the findings of this study revealed that women mean age was 27.48±2.5 to 28.02±2.89 years old while, mean age at diagnosis of SLE in both groups under the study was between age 18.93±3.56 to 19.02±3.58 years. This finding is in agreement with Sestak *et al.* [23] who referred that the most common age for SLE is between fifteen to forty five years, which is called the ‘‘bearing age’’ which means that in this period, fertility hormones "estrogen and progesterone" influencing vulnerability to this disease. Our study finding also supported Abu-Shakra [24] who stated that symptoms of SLE usually manifest themselves initially between the ages of 20 and 40 years.

The present study displays around one third only in both groups under the study had a history of previous pregnancy with SLE. These findings may be due to the studied women afraid of being pregnant as for the potential risks such as: pregnancy-induced hypertension and preterm birth. The current finding is in the same line with Yang *et al.* [25] who found that the majority of females with SLE get pregnant but after counselling with an obstetrician for high-risk pregnancies. The current study clarified that there were many complications in previous pregnancies for control and study groups as abruptio placenta, gestational diabetes and flare, but the most complication showed was preeclampsia in both groups, in addition there was no statistical significant difference between both groups regarding previous obstetric history. These findings are in difference with Borella *et al.* [26] who reported that SLE flares occurred in 57 % of the pregnancies ranged from mild in (74 %) to moderate in (10 %) and severe in (16 %) of cases.

Regarding to the total knowledge of intervention group, the current study showed that there is a highly statistically significant improvement regarding to SLE, SLE flares, preconception care for SLE, self-care during pregnancy, preparation & management for labor and postpartum period with awareness of breast feeding and proper family planning methods these improvement due to implementation of evidence based nursing guideline. Moreover total knowledge scores were improved from15.04±0.67 to 22.99±4.52 post implementation of guideline and increased to reach 33.15±2.17 at follow-up after 6 months. This finding is in agreement with Yariz *et al.* [27] who reported that three quarters of patients with SLE are usually acquiring information about the nature of disease, pathology, treatment, prognosis and life style changes. Moreover, the current study finding is inconsistent with Sohng *et al.* [28] who found the same results after implementing self-management course on Korean patients with SLE. This might be due to the knowledge is usually accepted to be taught by patients with chronic illnesses to be aware of their own status.

Concerning comparison between women's health on the study group before and after implementation of guideline the result of the current study indicated that most common of study group were committed to SLE medications after implementation of guideline by 6 months compared to quarter of them before implementation of guideline. The current study finding is supported with Ganachari *et al.* [29] who conducted a study to assess the knowledge of systemic lupus erythematosus (SLE) patients before and after clinical pharmacist's education including lifestyle modifications, via the distribution of patient information leaflets (PILs) and compare the same with the control group who continued with conventional

therapy. They reported that a significant ($P < 0.001$) improvement in the medication knowledge scores and medication adherence was seen in test group compared to the control group.

Moreover, the current study findings showed that three quarter of SLE women in the study group had good vitality after implementation of guideline by 6 months compared to one quarter of them before intervention. Also one quarter of women had severe degree of pain after implementation of guideline by 6 months compared to two thirds of them before intervention. This finding is in the same lines with Drenkard *et al.* [30] who conducted an intervention study on 49 African American women with SLE who received medical care at a public lupus clinic in Atlanta, Georgia, US. They compared pre-post changes (from baseline to 4 months after the start of the intervention) in health status. They reported that among health status outcomes assessed, only the physical components showed signi?cant improvement post-intervention. Also, our study finding is supported by Cano-Garcia *et al.* [31] who conducted an intervention study to evaluate the effectiveness of a standardized educational intervention to improve pain, fatigue, sleep and health-related quality of life (HRQoL) in patients with systemic lupus erythematosus and mentioned that educational intervention had positive effects on pain, sleep and HRQoL in SLE patients at 3 and 6 months. Furthermore, the severity of disease flare was minimized from nearly half before implementation of guideline to one fifth after implementation of guideline. That proved by highly statistical significant decrease in clinical manifestation of disease presented on decrease mean score of SLEDAI index after implementation of guideline. Our study finding is in accordance with Cano-Garcia *et al.* [31] who conducted a Pilot Study of standardized educational programme for improvement of chronic pain and fatigue in systemic lupus erythematosus and mentioned that there was significant decrease on SLEDAI after 3 and six months compared to baseline assessment (SLEDAI mean score at baseline was 2.8±2, at 3 months was 2.73±1.52 and at 6 months was 2.54±2.2).

Concerning laboratory investigations our study finding showed that there was significant change in main laboratory investigation after implementation of guideline as main predictor of disease control at preconception period including decrease percentage of high Anti dsDNA antibodies, low C3 & C4, high ESR, positive ACL antibodies and Anti-Ro/SSA. The current study findings were supported by literature that mentioned preconception counseling is essential to evaluate the chance of both fetal and maternal complications and to provide the patient with reliable information regarding specific problems and expected management plan. So, complete set of autoantibodies should be available before pregnancy including ACL, Anti dsDNA antibodies and Anti-Ro/SSA given their close link with specific pregnancy complication [5].

Regarding comparison between SLE pregnant women in control and study group concerning their preconception history our study finding indicated that all women in the study group had planned pregnancy and all of them in clinical remission as determined by SLEDAI mean score was ≥4 (3.92±0.26) compared to one fifth of women in the control group had planned pregnancy but most nearly two third of them had SLE flare 6 months prior to pregnancy and their SLEDAI mean score was <4 (5.31±2.10). The current study finding is in the same line with Hussein *et al.* [32] who conducted a prospective study on 84 women to investigate pregnancy course and out-come in female with SLE and reported that 71% of patients were planned pregnancy and all of them were in clinical remission as determined by SLEDAI index.

Concerning comparison between SLE pregnant women in control and study group regarding current pregnancy our study finding indicated that minority of the studied women in the study group had disease activity during second and third trimester of pregnancy compared to nearly one third of the studied women in the control group. The current study finding is in the same line with Madazli *et al.* [33] who conducted a retrospective study among 65 consecutive case of SLE to determine pregnancy outcome and found that 7.7% of women had SLE activation rate. This finding could be justified by two third of the studied women in the control group had flare 6 months prior pregnancy compared to none of women in the study group that is accordingly with Takahashi *et al.* [34] who conducted a retrospective study to review maternal and fetal outcome in pregnant women with SLE and evaluate risk factors that contribute to SLE flare up and stat that SLE fare-up rate was 17.5%.

Concerning pregnancy outcome, the result of comparison between women in the study and control group indicates that less than one tenth and nearly one quarter of the control group had flare in first, second and third trimester. The current study finding is in agreement with Ku *et al.* [35] who conducted a retrospective study to analyze the fetal and maternal out- comes of 83 Chinese women with SLE and reported that 12 patients (63.1%) had SLE flare that first occurred during the second trimester mainly during the18th week.

This could be explained by effect of hormonal swings of pregnancy in the second trimester accompanying with the alteration of immune-system, may be the risk factor for new onset SLE during pregnancy. The present study finding is supported with Elisabetta *et al.* [26] who conducted a prospective cohort study to evaluate predictors of disease flares during pregnancy & obstetric and fetal complications in of systemic lupus erythematosus (SLE) patients among one hundred and thirty-two pregnancies in 96 SLE patients and found that maternal lupus flares occurred in 57 % of pregnancies and were being best predicted by the number of flares before conception. This also was proved in our study as nearly two third of the studied women in control group had disease activity prior pregnancy that consider a risk factor for SLE relapse during pregnancy.

Regarding kind of flare less than one fifth, less than one tenth and minority of the studied women in the control group had dermatological, articular and hematological flare respectively. The present study finding is in the same line with Elisabetta *et al.* [26] who reported that manifestations during flares were best predicted by the same features occurred before conception: dermatological flares by skin rash, renal flares by nephritis and hematological flares by hematological abnormalities.

Concerning SLE disease activity during pregnancy there was statistical significant difference between both groups as women on the study group had no change of LAI-P score more than 0.25 through pregnancy while, women on the control group had change of score more than 0.25. Our study finding is supported by Megan *et al.* [36] who conducted a study to assess all pregnancies in a cohort of lupus patients were observed prospectively. They compared disease activity in each trimester and reported those women with moderate to severe lupus activity during pregnancy leads to poorer pregnancy outcomes than low or no lupus activity during this period.

Regarding obstetric complications; the result of the present study showed that less than one quarter and more than one third of the control group had complications in second and third trimester of current pregnancy compared to less than one third and more than one third of the study group. In addition decrease maternal and fetal complications in our study finding can be explained by impact of flares depends on their type and number. Dermatologic flares usually do not interfere with the success of pregnancy. More severe may be the hematological and renal flares.

Relating to kind of complications more than one third, less than one fifth, nearly one quarter and less than one tenth of the control group had abortion, pre-eclampsia, eclampsia, PROM and gestational diabetes respectively. While, minority of the studied women in the study group had pre-eclampsia, gestational diabetes and PROM respectively. The present study finding is in agreement with Chen *et al.* [37] who conducted a retrospective study to evaluate the outcome of 80 pregnant women with systemic lupus erythematosus (SLE) were divided into three groups. Group A: patients in remission for > 6 months before pregnancy; Group B: patients with SLE disease activity in the six months before pregnancy; Group C: patients with new onset SLE during pregnancy. They reported that nine (17.65%) pregnancies in group A, three (23.08%) patients in group B and 12 (63.16%) patients in group C had gestational hypertension. Five (9.80%) pregnancies in group A, two (15.38%) patients in group B and six (31.58%) patients in group C had pre-eclampsia or eclampsia and only one patient in group C was diagnosed HELLP syndrome. Group C had the highest incidence of obstetric complications.

Regarding to maternal outcome of pregnancy, more than three quarters of women in the study group had vaginal delivery compared to more than one third of women in the control group. While, less than one quarter of women in the study group had caesarean delivery compared to less than two third of women in the control group. Our study finding is in accordance with Ideguchi *et al.* [38] who performed a retrospective analysis of 41 SLE patients (55 pregnancies) and mentioned that vaginal deliveries occurred in 29 pregnancies (71%), while cesarean section (CS) was necessary in 12 pregnancies (29%, including one twin birth). The indications for CS were six cases of non-reassuring fetal status, two cases of abruption of placenta (including one twin birth), one case of late deceleration, threatened premature delivery, parental deterioration of renal function and parental convulsion.

As regard fetal outcome the result of the present study showed that none of the studied women in the study group had abortion compared to one quarter of the studied women in the control group. In addition more than three quarter of the studied women in the study group had full term neonate versus less than one quarter of the studied women in the control group. Concerning birth weight less than three quarter of the studied women in the study group had neonate with normal birth weight compared to less than one quarter of the studied women in the control group. The present study finding is in the

same line with Chen *et al.* [37] who found that 76.47% of pregnancies achieved full-term deliveries and 80.39% of pregnancies achieved live born infants. Five neonates were small-to-date infants. In group B, only 23.08% pregnancies achieved full-term deliveries and 30.77% of pregnancies achieved live born infants. The current study finding is also in the same line with Megan *et al.* [36] who reported that there were 115 live births (91.3%), miscarriages (7.9%), no stillbirth and only (0.8%) neonatal death in a group with stable status of SLE at conception and (66.1%) live births, (12.5%) miscarriages and (10.7%) neonatal death in the other group with active status of SLE at conception.

Furthermore, the result of the current study indicated that Apgar score was higher in the study group compared to control group at 1 and 5 minutes with statistical significant difference. Our study finding is supported with Megan *et al.* [36] who mentioned that low Apgar score (less than 7) at 1 min ($p<0.0001$) and 5 min ($p=0.0002$), between two groups (group of SLE disease activity (30.6%) and group of SLE disease stable in (69.4%) patients).

Finally, the result of current study proved that improvement of pregnancy outcome (either maternal or fetal) on the study group compared to control group influence by increasing level of awareness and practice of preconception evidence based guideline that reflected upon delayed pregnancy until disease controlled for at least 6 months and multidisciplinary care during pregnancy.

CONCLUSIONS

The findings of the current study supported the hypothesis of this study which stated that implementation of preconception evidence based nursing guideline for women with SLE will be effective on improving pregnancy outcome than SLE pregnant women that receive routine care.

Recommendations: In the light of the previous results of the present study the following recommendations are suggested that application of preconception evidence based nursing guideline for SLE women at rheumatology, immunology clinics at Ain Shams University Hospital. There is an urgent need for further research to evaluate effect of preventive strategies on improving pregnancy outcome among SLE women.

REFERENCES

1. Kwok, L.W., L.S. Tam, Y.Y. Leung and E.K. Li, 2011. Predictors of maternal and fetal outcomes in pregnancies of patients with systemic lupus erythematosus. Lupus, 20: 829-836.
2. Dall'Era, M., 2013. Systemic lupus erythematosus. In Current rheumatology diagnosis & treatment. 3rd ed. Eds., Imboden, J.B., J.H. Stone and D.B. Hellmann. USA: McGraw-Hill; pp: 532-548.
3. Ostensen , M. and M. Clowse, 2013. Pathogenesis of pregnancy complications in systemic lupus erythematosus, Current Opinion in Rheumatology. 25(5): 591-596.
4. Graziela Carvalheiras, Pedro Vita, Susana Marta, Rita Trovão, Fátima Farinha, Jorge Braga, Guilherme Rocha, Isabel Almeida, António Marinho, Teresa Mendonça, Paulo Barbosa, João Correia and Carlos Vasconcelos , 2009. Pregnancy and Systemic Lupus Erythematosus: Review of Clinical Features and Outcome of 51 Pregnancies at a Single Institution. Clinic Rev Allerg Immunol., 38: 302-306.
5. Ruiz-Irastorza, G. and M.A. Khamashta, 2011. Lupus and pregnancy: integrating clues from the bench and bedside. Eur. J. Clin Invest, 41(6): 672-678.
6. Carvalheiras, G., P. Vita, S. Marta, R. Trovao, F. Farinha, J. Braga, G. Rocha, I. Almeida, A. Marinho, T. Mendonça, P. Barbosa, J. Correia and C. Vasconcelos, 2010. Pregnancy and systemic lupus erythematosus: review of clinical features and outcome of 51 pregnancies at a single institution. Clinical Reviews in Allergy & Immunology, 38(2-3): 302-6.
7. Lateef, A. and M. Petri, 2013. Managing lupus patients during pregnancy. Best Practice & Research Clinical Rheumatology, 27: 435-447.
8. Ateka-Barrutia, O. and C. Nelson-Piercy, 2012. Management of rheumatologic diseases in pregnancy. International Journal of Clinical Rheumatology, 7(5): 541-558.
9. Pooja Mittal, Aparna Dandekar and Danielle Hessler, 2014. Use of a Modified Reproductive Life Plan to Improve Awareness of Preconception Health in Women with Chronic Disease. The Permanente Journal Spring, 18(2): 28-32.
10. Elizabeth W. Mitchell, Denise M. Levis and Christine E. Prue, 2012. Preconception Health: Awareness, Planning and Communication among a Sample of US Men and Women. Maternal Child Health J., 16: 31-39.

11. Boukje Van Der Zee, Inez De Beaufort, Sevilay Temel, Guido de Wert, Semiha Denktas and Eric Steegers, 2011. Preconception care: An essential preventive strategy to improve children's and women's health. Journal of Public Health Policy, 32: 367-379.
12. Zohra S. Lassi, Ayesha M. Imam, Sohni V. Dean and Zulfiqar A. Bhutta, 2014. Preconception care: screening and management of chronic disease and promoting psychological health. Reproductive Health, 11(3): 15-35.
13. Yvonne Van Eijk-Hustings, Astrid van Tubergen, Carina Boström, Elena Braychenko, Beate Buss, José Felix, Jill Firth, Alison Hammond, Benny Harston, Cristina Hernandez, Masa Huzjak, Jana Korandová, Marja Leena Kukkurainen, Robert Landewé, Maryse Mezieres, Marijana Milincovic, Antonella Moretti, 15 Susan Oliver, Jette Primdahl, Marieke Scholte-Voshaar, Jenny de la Torre-Aboki, Jennifer Waite-Jones, Rene Westhovens, Heidi Andersen Zangi, Turid Heiberg and Jackie Hill, 2011. EULAR recommendations for the role of the nurse in the management of chronic inflammatory arthritis. Ann Rheum Dis. 4: 2001-2008.
14. Voorneveld, H., L. Duymaer Van Twist and C. Veldhuizen, 2008. Development of a guideline for rheumatology nurses in the Netherlands about supervision, education and administer biological agents. Ann. Rheum. Dis., 67: 670-681.
15. Barrett R., Lena Salach, Amanda Van Hal, Lindsay Bevan and Deanna Telne, 2013. Development and dissemination of preconception health care tool in primary care, Center for effective practice, Toronto.
16. Bellotti, M., 2003. Systemic lupus erythematosus Quizes. Lancet. Feb 17; 369(9561): 587-96.
17. Jolly, M., A.S. Pickard, C. Wilke, H.W. Lin, S. Khandelwal and R. Rodby, 2007. Development and validation of US lupus specific patient reported outcome measure. Arthritis & Rheum, 6(9): 113-123.
18. Homer, C.S.E., C.J. Catling-Paull, D. Sinclair, N. Faizah, V. Balasubramanian and M.J. Foureur, 2010. Developing an interactive electronic maternity record. Br J. Mid., 8(6): 384-9.
19. Ruiz-Irastorza, G., M.A. Khamashta and C. Gordon, M.D. Lockshin, K.R. Johns, Sammaritano and G.R.V. Hughes, 2004. Measuring Systemic Lupus Erythematous Activity During Pregnancy: Validation Of Lupus Activity Index In Pregnancy Scale. Arthritis Rheum., 51: 78.
20. Gans-Lartey, F., B.A. O'Brien, F.O. Gyekye and D. Schopflocher, 2013. The relationship between the use of the partograph and birth outcomes at Korle-Bu teaching hospital. Midwifery, 29: 461-467.
21. Papile, L.A., 2001. The Apgar score in the 21st century. N. Engl. J. Med., 344: 519-520.
22. Yang , M.J., C.Y. Chen, W.H. Chang, J.Y. Tseng and C. Yeh, 2015. Pregnancy outcomes of Systemic Lupus Erythematosus in relation to lupus activity before and during pregnancy. Journal of Chinese Medical Association, 78: 235-240.
23. Sestak, A., B. Fürnrohr, J. Harley, J. Merrill and B. Namjou, 2011. The genetics of systemic lupus erythematosus and implications for targeted therapy. Ann. Rheum Dis., 70: 37-43.
24. Abu-Shakra, M., 2011. Quality of life in systemic lupus erythematosus: A controlled study. J. Rheumatol., 26: 306-309.
25. Ming-Jie Yang, B., B. Chih-Yao Chen, C. Wen-Hsun Chang T. Jen-Yu and Y. Chang-Ching, 2015. Pregnancy outcome of systemic lupus erythematosus in relation to lupus activity before and during pregnancy, Journal of the Chinese Medical Association, pp: 235-240.
26. Elisabetta Borella, Andrea Lojacono, Mariele Gatto, Laura Andreoli, Marco Taglietti, Luca Iaccarino, Edoardo Casiglia, Leonardo Punzi, Angela Tincani and Andrea Doria, 2014. Predictors of maternal and fetal complications in SLE patients: a prospective study. Immunol Res., 60: 170-176.
27. Yariz, Y., W. Qweeb and T. Etail, 2012. Therapeutic opportunities in systemic lupus erythematosus: state of the art and prospects for the new decade. Ann. Rheum Dis., 69: 1603-1.
28. Sohng, T., G. Murdaca, B. Colombo and F. Puppo, 2011. Emerging biological drugs: a new therapeutic approach for Systemic Lupus Erythematosus. An update upon efficacy and adverse events. Autoimmun Rev., 11(1): 56-60.
29. Ganachari, M.S. and Syeda Atiya Almas, 2012. Evaluation of clinical pharmacist mediated education and counseling of systemic lupus erythematosus patients in tertiary care hospital. Indian Journal of Rheumatology, 7(1): 7-12.
30. Drenkard, C., C. Dunlop-Thomas, K. Easley, G. Bao, T. Brady and S.S. Lim, 2012. Benefits of a self-management program in low-income African-American women with systemic lupus erythematosus: results of a pilot test. Lupus., 21: 1586-1593.

31. Cano-Garcia, L., C. Romero-Barco, S. Manrique-Arija, I. Ureña-Garnica, F.G. Jimenez Nuñez, M.D.C. Ordoñez-Cañizares, L. Nieves-Martín, N. Mena-Vázquez, M.V. Irigoyen-Oyarzabal and A. Fernández-Nebro, 2014. AB1143-HPR A Pilot Study of A Standardized Educational Programme for the Improvement of Chronic Pain and Fatigue in Systemic Lupus Erythematosus (SLE) Annals of the Rheumatic Diseases., 73: 1215-1216.
32. Hussein, E.A., R.R. Mohamed and A.M. Nabil, 2016. pregnancy outcome in patients with systemic lupus erythematosus: a single center study in the high risk pregnancy unit. Middle East Fertility Society Journal, 21: 168-174.
33. Madazli R., Mehmet Aytac Yuksel, Mahmut Oncul, Metehan Imamoglu and Handan Yilmaz, 2014. obstetric outcome and prognostic factors of lupus pregnancies. Arch Gynecology Obstetric, 289: 49-35.
34. Takahashi K., Kazuya Mimura, Takeshi Kanagawa, Yukiko Kinugasa-Taniguchi, Masayuki Endo, Shinya Matsuzaki, Keiichi Kumasawa, Kae Hashimoto, Takuji Tomimatsu and Tadashi Kimura, 2013. Disease fare-ups and obstetric outcomes in pregnant women with systemic lupus erythematosus. Hypertension Research In Pregnancy, 1: 103-107.
35. Ku, M., S. Guo, W. Shang, Q. Li, R. Zeng, M. Han, Shuwang Ge and Gang Xu, 2016. Pregnancy Outcomes in Chinese Patients with Systemic Lupus Erythematosus (SLE): A Retrospective Study of 109 Pregnancies. PLoS ONE 11(7): e0159364.doi:10.1371/journal. pone.0159364.
36. Megan E.B. Clowse, Laurence S. Magder, Frank Witter and Michelle Petri, 2005. The Impact of Increased Lupus Activity on Obstetric Outcomes. Arthritis & Rheumatism, 52(2): 514-521.
37. Chen S., Xuejuan Sun, Bide Wu and Xuejian Lian, 2015. Pregnancy in Women with Systemic Lupus Erythematosus: A Retrospective Study of 83 Pregnancies at a Single Centre. Int. J. Environ. Res. Public Health, 12: 9876-9888.
38. Ideguchi H., Shigeru Ohno, Takeaki Uehara and Yoshiaki Ishigatsubo, 2013. Pregnancy Outcomes in Japanese Patients with SLE: Retrospective Review of 55 Pregnancies at a University Hospital. Clinic Rev Allerg. Immunol., 44: 57-64.