KNOWLEDGE ATTITUDE AND PRACTICE TOWARDS COVID-19 AMONG PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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Abstract: Background: Systemic lupus erythematosus (SLE) during COVID-19 is considered a dangerous illness that threatens the lives of infected people as being a multisystem autoimmune disease with innumerable clinical manifestations that imposes a negative effect on health. In this pandemic SLE participants are more likely to be at high risk of getting the infection and developing severe symptoms and death. **Design:** A cross-sectional descriptive design was used to conduct the study. **Setting**: The study was conducted at Rheumatology and Rehabilitation Unit at Kasr Al Ainy, Cairo University hospitals. **Sampling:** A convenient sample of 117 adult male and female participants were selected to achieve the aim of the study. Three instruments were used for data collection (Knowledge about COVID structured interview questionnaire, attitudes towards COVID-19 and Practices related to COVID-19). **Results**: The average knowledge score was 10.2±2.6, and most of the participants (84.6%) had inadequate knowledge. The average attitude classification was 21.7±3.4, about two third (61.5%) of participants had a Positive attitude. The average Practice score was 47.9±6.2, nearly half of the participants (51.3%) had a good practice. There was a statistical significant positive correlation between attitude, knowledge, and practice score. **Conclusion**: Our study findings have shown that the level of the knowledge about COVID-19 infection of the most participants was generally inadequate. Also about two thirds of participants had a Positive attitude toward COVID-19 and that half of the participants had a good practice toward COVID-19 preventive measures. **Recommendations:** A health education guideline should be provided about prevention of COVID-19 for patients with Systemic Lupus Erythematosus. Mobile applications should be developed to educate patients about COVID 19.

Keywords: *Attitude, COVID-19, Systemic lupus Erythematosus, Knowledge, Practice*

Introduction

The COVID-19 pandemic, also known as the coronavirus pandemic, was a major universal problem of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). There have been 106,797,721 confirmed cases of COVID-19, including 2,341,145 deaths, reported (WHO 2021). In Egypt the number of confirmed cases is 171, 93 while the number of deaths is 9,857 (Worldometer, 2021). Fast, unpredicted and uncontrolled increases of COVID-19 cases necessitate critical responses for this pandemic especially for participants with chronic illness like Systemic Lupus erythematosus (SLE) (WHO Corona Virus Disease Dashboard, 2021).

Systemic lupus during COVID-19 is considered a hazardous illness that threatens the lives of infected people as being a multisystem autoimmune disease with uncountable clinical manifestations that imposes a negative effect on health (Ayman, Gheith & Badran, 2017). In this pandemic SLE participants are more likely to be a high risk of receiving the infection and developing severe symptoms and death. So precise assessment of participants' knowledge, attitude and proper practice for obeying the recommended preventive measures include social distancing, wearing face masks in public, ventilation and air-filtering, hand washing, covering one's mouth when sneezing or coughing, disinfecting surfaces, monitoring and self-isolation for symptomatic people is necessary for chronic illnesses as SLE participants to overcome health crisis for this group (Maital & Barzani, 2020).

Nurses in collaboration with a multidisciplinary team constitute the largest workforce, and they are the first people present to deliver care during periods of crisis. They play a very important role both locally and globally. They are on the front lines caring for their participants. Nurses are important in managing a health crisis because they are a vital link between the patient and the rest of the health care team. (Mahroum et al 2023) Nurses with their participants through assessment and critical thinking are able to notice subtle changes in their participants that could indicate they are decompensating or getting worse, or getting better.

Nurses are able to determine the human reaction to the medical problem. They spread their assessment findings to providers, they are able to determine if respiratory therapy needs to be called, they are able to assess the patient's response to medical treatments, and they educate the participants, alongside with providing a listening ear or a calming touch. (Charles, 2020 and Gray et al. 2017)

Nurses and health care providers need to have a proper assessment for SLE participants and offer awareness regarding having adequate knowledge, attitude and practice in this disaster and preparing them to have the knowledge and skills to protect themselves against risk during this

pandemic by having enough proper personal protective equipment (PPE) to use while moving, practice meticulous hand washing,…….etc. Therefore the current study will be conducted to assess knowledge, attitude and reported practices in systemic lupus erythematosus participants towards COVID-19 infection.

Significance of the study:

Globally, America has the highest incidence and prevalence of SLE, Australia reporting the lowest prevalence and Africa reporting the lowest incidence. (Kamal et al, 2024) SLE is more prevalent in the female population during the childbearing age between 15 to 44 year. The overall estimated prevalence of adult Systemic Lupus Erythematosus in Egypt was 6.1/100.000 population (1.2/100.000 males and 11.3/100.000 females). (Gheita et al., 2021) Participants with SLE need to be aware regarding having adequate knowledge, attitude and practice toward COVID 19 to protect them during this pandemic Therefor the current study was conducted to assess knowledge, attitude and reported practices in systemic lupus participants towards COVID-19 infection.

Methods

Purpose

The purpose of the current study is to assess knowledge attitude and reported practice towards COVID-19 among patients with systemic lupus erythema

Research Design

A cross-sectional descriptive design was used to provide a snapshot of the SLE participants' knowledge, attitude and reported practice towards COVID-19 infection.

Setting

The study was conducted at Kasr Al Ainy Teaching Hospital in Cairo University hospitals at Rheumatology and Rehabilitation Unit.

Sample

A convenient sample of 117 adult male and female participants with Systemic Lupus erythematosus. Participants who are able to communicate verbally constituted the study sample. The sample size was calculated using a G-power version 3.1.1 for power analysis. A Power of .95 (β = 1-.95 = .05) at alpha .05 and the significance level, P $\leq$ 0.05 was utilized (Gray, Grove & Sutherland, 2017)

Instruments:

Data was collected using the following instruments:-

Instrument one: Knowledge about COVID-19

▪ **Part 1:** Structured Interview Questionnaire about characteristics of participants: It was developed by the researcher. This part was contained two subparts:
- Subpart one: It includes Socio-demographic data covering questions related to age, gender, level of education, occupation, marital status, source of information about COVID-19 ………...etc.

- Subpart two: It contained lifestyles, reported symptoms exacerbation, general health since diagnosis and health history such as duration of illness, history of chronic disease…..etc. according to patient medical record.

▪ **Part 2**: Participants Knowledge towards COVID-19 (PK- COVID -19).This part collects data related to participants knowledge towards COVID -19 based on WHO Q &A on coronaviruses (COVID-19) published in 2020. It includes items related to information about possible symptoms of COVID -19, isolation period, if COVID-19 is fatal….etc.

Scoring system:

There were 13 items in the knowledge section, and each item contained 3 options, namely, "true", "false" and "don't know "; 1 point was given for a correct answer, and 0 points were awarded for an incorrect answer or a "don't know" response. The total score of this section ranged from 0 to 13, and higher scores were correlated with more knowledge.

Instrument two: Attitude towards COVID-19. It was developed by W.H.O. (2020)

It includes items related to thinking about getting COVID-19, worry about family to get the infection, isolation acceptance……….etc. Scoring system: The attitude section included five items, and a Likert scale was used to assess the level of agreement with the statements; response options ranged from 1 (strongly disagree) to 5 (strongly agree). The total scores in

this section could range from 5 to 25, and higher scores indicated a more positive attitude.

Instrument three: Participants Practice towards COVID-19 Prevention (PP- COVID-19 P). This instrument included participants practice towards COVID-19. It was developed by W.H.O (2020). It includes items related to average time of hand washing, using soap and water, wearing face mask……….etc. Scoring system: The practices section included 15 items, and a Likert scale was used to assess the level of agreement with the statements; the response options ranged from 1 (never) to 4 (always). The total scores in this section could range from 15 to 60, with higher scores correlating with better protective actions being taken.

Validity and Reliability:

Validity of instruments was reviewed by a Jury of five experts (professors) in the field of the nursing and medicine in order to review the instrument for objectivity, comprehensiveness, clarity, relevance and simplicity. The Cronbach's alpha coefficient of the knowledge, practices and attitude questionnaire were (0. 87, 0.89 and 0.76) indicating acceptable internal consistency.

Ethical Consideration

Approval of the Institutional Review Board was obtained from the Scientific Research Ethics Committee of Faculty of Medicine, Cairo University (15/6/2021, N-35-2021). Each participant was informed about the purpose, the procedure and the significance of the study. Participants

were assured that participation in the study was completely voluntary and those who were agreed to participate were signed a consent form. A formal official consent was obtained from participants regarding their acceptance to participate in the study.

Procedure:

A letter was submitted from the Dean of the Faculty of Nursing/Cairo University to the director of rheumatology and rehabilitation unit including purpose of the study and methods of data collection.

Once official permission was obtained to proceed with the proposed study, the researchers started to collect data from August 2021to June 2022. First the researchers started by introducing themselves. The study sample received explanation about the nature and purpose of the current study then, the researcher started to collect data about characteristics of participants, knowledge, practices and attitudes towards COVID 19. The questionnaire sheets consumed about 20-30 minute to be fulfilled by the researcher.

Statistical Analysis

Data were analyzed using SPSS statistical package version 28. Numerical data were summarized as means and standard deviations, while qualitative data were described as frequencies and percentages. Relation between quantitative data was done using the Mann-Whitney test. Relation between qualitative data was done using the Chi-square test. Logistic regression was applied to calculate the odds ratio (OR), and its 95% confidence intervals (CI) were calculated to estimate the risk. All significant factors affecting knowledge, attitude, and practice score (at p-value 0.1) on univariate analysis were entered in multivariate analysis using the stepwise logistic regression method. Correlation between numerical values was done by spearmen correlation

Results

The study included 117 participants. The average age of the participants was 31.9±9.7 years. Most of the participants (93.2%) were females, and more than half of the participants were married. Most of the participants (87.2%) were not working, and 70.9% lived in urban areas, less than one-third of the participants (34.2%) had chronic disease, and the most frequent sources of information was Television. Less than one-third of the participants (23.9%) had a Previous COVID 19 infection, and 19.7% of participants received COVID-19 vaccine (Table 1). Table 2 showed the knowledge, attitude, and practice scores among the studied participants. The average knowledge score was 10.2±2.6, and most of the participants (84.6%) had inadequate knowledge. The average attitude classification was 21.7±3.4, about two thirds (61.5%) of participants had a Positive attitude. The average Practice score was 47.9±6.2, nearly half of the participants (51.3%) had a good practice.

Participants with previous COVID-19 infection had a significantly higher proportion of adequate knowledge than those without previous COVID 19

infection (28.6% versus 11.2%, p-value=.027), and participants with longer disease duration had significantly higher adequate knowledge (p-value=.007). Participants taking information from friends had significantly inadequate knowledge (p-value= .027). No statistically significant relation was found between gender, education, marital status, and knowledge (Table 3).

Participants with chronic disease had significantly lower positive attitudes than those without chronic disease, participants who received information from medical personnel and participants wearing masks had significantly higher positive attitudes (p-values = <.001, .007) respectively, whereas participants with chronic disease and those who had previous COVID- 19 infection had significantly lower positive altitude (p-values = .024, .020) respectively (Table 4).

Participants receiving information from television, medical personnel, and friends had significantly higher good practice, participants wearing masks, and those who didn't received COVID -19 vaccinations had significantly higher good practice. In addition, participants with previous COVID-19 infection, and participants with shorter disease duration had significantly higher good practice (table 5).

Independent factor affecting knowledge score was disease duration, and independent factor affecting attitude and practice score was receiving information from medical personnel (table 6).

There was a significant positive correlation between attitude, knowledge, and practice score; in addition there was a significant positive correlation between attitude and knowledge (table 7).

Table 1: Characteristics of Studied Participants

Characteristics	Total (n=117)
Age (years)	31.9±9.7
Sex	
Male	8 (6.8%)
Female	109 (93.2%)
Marital status	
Married	69 (59%)
Single	35 (29.9%)
Divorced	11 (9.4%)
Widow	2 (1.7%)
Educational level	
Read and write	33 (28.2%)
Primary or preparatory	18 (15.4%)
Secondary	40 (34.2%)
University education	26 (22.2%)
Working condition	
Working	15 (12.8%)
Not working	102 (87.2%)
Residence	
Rural	34 (29.1%)
Urban	83 (70.9%)

Chronic diseases	
No	77 (65.8%)
Yes	40 (34.2%)
Smoking	
No	115 (98.3%)
Yes	2 (1.7%)
Sources of information*	
Television	98 (83.8%)
Medical personnel	48 (41%)
Friends	47 (40.2%)
Social media	47 (40.2%)
Using mask	
Yes	97 (82.9%)
Type of mask	
Cloth	22 (22.7%)
Medical	75 (77.3%)
Received COVID-19 Vaccine	
Yes	23 (19.7%)
Previous COVID-19 infection	
Yes	28 (23.9%)
Duration of disease (years)	7.5±4.5

*More than one answer

Table 2: Knowledge, Attitude, and Practice Scores among the Studied Participants

Level of knowledge	Total (n=117)
Knowledge score	10.2±2.6
Knowledge classification	
Inadequate knowledge	99 (84.6%)
Adequate knowledge	18 (15.4%)
Attitude score	21.7±3.4
Attitude classification	
Negative attitude	45 (38.5%)
Positive attitude	72 (61.5%)
Practice score	
Practice classification	47.9±6.2
Bad	2 (1.7%)
Fair	55 (47%)
Good	60 (51.3%)

Table 3: Associative Relation between Level of Knowledge and Participants Characteristics

Characteristics		Level of Knowledge		
	n	Inadequate	Adequate	p-value
Age (years)	117	31.64 9.908	33.5± 8.767	.317
Sex				
Male	8	7 (87.5%)	1 (12.5%)	.815
Female	109	92 (84.4%)	17 (15.6%)	
Marital status				
Married	69	58 (84.1%)	11 (15.9%)	
Single	35	30 (85.7%)	5 (14.3%)	.976
Divorced/widow	13	11 (84.6%)	2 (15.4%)	
Educational level				
Read and write	33	28 (84.8%)	5 (15.2%)	
Primary or preparatory	18	15 (83.3%)	3 (16.7%)	
Secondary	40	31 (77.5%)	9 (22.5%)	
University education	26	25 (96.2%)	1 (3.8%)	.237
Working condition				
Working	15	13 (86.7%)	2 (13.3%)	.814
Not working	102	86 (84.3%)	16 (15.7%)	
Residence				
Rural	34	30 (88.2%)	4 (11.8%)	.487
Urban	83	69 (83.1%)	14 (16.9%)	
Chronic diseases				
No	77	66 (85.7%)	11 (14.3%)	.648
Yes	40	33 (82.5%)	7 (17.5%)	
Smoking				
No	115	97 (84.3%)	18 (15.7%)	1.000
Yes	2	2 (100.0%	0 (0%)	
Sources of information*				
Television	98	83 (84.7)%	15 (15.3%)	.976
Medical personnel	48	42 (87.5%)	6 (12.5%)	.471
Friends	47	44 (93.6%)	3 (6.4%)	.027
Social media	47	42 (89.4%)	5 (10.6%)	.224
Using mask				
No	20	19 (95%)	1 (5%)	.157
Yes	97	80 (82.5%)	17 (17.5%)	
Receiving COVID-Vaccine				
No	94	82 (87.2%)	12 (12.8%)	.112
Yes	23	17 (73.9%)	6 (26.1%)	
Previous COVID infection				
No	89	79 (88.8%)	10 (11.2%)	.027
Yes	28	20 (71.4%)	8 (28.6%)	
Duration of disease (years)	7.5±4.5	7.1±4.2	10.4±5.4	.007

*more than one answer

Table 4: Associative Relation between attitudes and Participants Characteristics Factors Affecting Attitude Score

Characteristics	n	Attitude		P -value
		Negative	Positive	
Age (years)	117	32.6±11.1	31.5±8.9	.701
Sex				
Male	8	4 (50%)	4 (50%)	.482
Female	109	41 (37.6%)	68 (62.4%)	
Marital status				
Married	69	28 (40.6%)	41 (59.4%)	.823
Single	35	12 (34.3%)	23(65.7%)	
Divorced/widow	13	5 (38.5%)	8 (61.5%)	
Educational level				
Read and write	33	10 (30.3%)	23 (69.7%)	.601
Primary or preparatory	18	8 (44.4%)	10 (55.6%)	
Secondary	40	15 (37.5%)	25 (62.5%)	
University education	26	12 (46.2%)	14 (35.8%)	
Working condition				
Working	15	8 (53.3%)	7 (46.7%)	.205
Not working	102	37 (36.3%)	65 (63.7%)	
Residence				
Rural	34	10 (29.4%)	24 (70.6%)	.198
Urban	83	35 (42.4%)	48 (57.8%)	
Chronic diseases				
No	77	24 (31.2%)	53 (68.8%)	.024
Yes	40	21 (52.5%)	19 (47.5%)	
Smoking				
No	115	44 (38.3%)	71 (61.7%)	1.000
Yes	2	1 (50%)	1 (50%)	
Sources of information*				
Television	98	36 (36.7%)	62 (63%)	.383
Medical personnel	48	5 (10.4%)	43 (89.6%)	<.001
Friends	47	13 (27.7%)	34 (72.3%)	.049
Social media	47	16 (34%)	31 (66%)	.421
Using mask				
No	20	13 (65%)	7 (35%)	.007
Yes	97	32 (33%)	65 (67%)	
Receiving COVID-Vaccine				
No	94	35 (77.8%)	59 (81.9%)	.581
Yes	23	10 (43.5%)	13 (56.5%)	
Previous COVID infection				
No	89	29 (32.6%)	60 (67.4%)	.020
Yes	28	16 (57.1%)	12 (42.9%)	
Duration of disease (years)	7.5±4.5	7.8±4.7	7.4±4.5	.583

*more than one answer

Table 5: Associative Relation between Level of Practice among Participants Having Different Personal Characteristics

Characteristics		Practice		P -value
	n	Bad/Fair	Good	
Age (years)	117	33.1±10.7	30.8±8.7	.226
Sex				
Male	8	4 (50%)	4 (50%)	.940
Female	109	53 (48.6%)	56 (51.4%)	
Marital status				
Married	69	31 (44.9%)	38 (55.1%)	
Single	35	19 (54.3%)	16 (45.7%)	.616
Divorced/widow	13	7 (53.8%)	6 (46.2%)	
Educational level				
Read and write	33	16 (48.5%)	17 (51.5%)	
Primary or preparatory	18	11 (61.1%)	7(38.9%)	
Secondary	40	16 (40.0%)	24 (60%)	.458
University education	26	14 (53.8%)	12 (46.2%)	
Working condition				
Working	15	9 (60%)	6 (40%)	.349
Not working	102	48 (47.1%)	54 (52.9%)	
Residence				
Rural	34	16 (47.1%)	18 (52.9%)	.818
Urban	83	41 (49.4%)	42 (50.6%)	
Chronic diseases				
No	77	33 (42.9%)	44 (57.1%)	.078
Yes	40	24 (60%)	16 (40%)	
Smoking				
No	115	56 (48.7%)	59 (51.3%)	.971
Yes	2	1 (50%)	1 (50%)	
Sources of information*				
Television	98	42 (42.9%)	56 (57.1%)	.004
Medical personnel	48	12 (25 %)	36 (75%)	<.001
Friends	47	11 (23.4%)	36 (76.6%)	<.001
Social media	47	18 (38.3%)	29 (61.7%)	.065
Using mask				
No	20	18 (90%)	2 (10%)	<.001
Yes	97	39 (40.2%)	58 (59.8%)	
Receiving COVID-Vaccine				
No	94	38 (40.4%)	56 (59.6%)	<.001
Yes	23	19 (82.6%)	4 (16.4%)	
Previous COVID infection				
No	89	38 (42.7%)	51 (57.3%)	.020
Yes	28	19 (67.9%)	9 (32.1%)	
Duration of disease (years)	7.5±4.5	8.5±3.9	6.7±4.9	.030

*more than one answer

Table 6: independent factors affecting knowledge, attitude and practice score

characteristics	p-value	OR	95% CI for OR	
			Lower	Upper
Knowledge score				
Disease duration	.007	1.3	1.2	1.5
Attitude score				
Taking information from medical personnel	**<.001**	11.8	4.2	33.6
Practice score				
Receive information from medical personnel	**<.001**	5.6	2.5	12.7

Table 7: Correlation between knowledge, attitude and practice

	Practice		Attitude	
	r	p-value	r	p-value
Attitude	.277	.003	----	
Knowledge	.322	<.001	.467	<.001

Discussion:

Systemic lupus erythematosus (SLE) during COVID-19 pandemic is considered a hazardous illness that threatens the lives of infected people as being a multisystem autoimmune disease with countless clinical manifestations that imposes a negative effect on health. Participants with SLE need to have a appropriate assessment regarding having adequate knowledge, attitude and practice toward COVID-19 and to determine the type and level of intervention that may be necessary for participants with SLE also preparing them to have the knowledge and skills to protect themselves against risk during this pandemic.

Our study outcomes have shown that most of the participants had inadequate knowledge with average knowledge score (10.2±2.6), about two thirds (61.5%) had a positive attitude and nearly half of the participants (51.3%) had a good practice toward COVID-19. The study findings corporates with

Ismail et al.(2023) in study of Knowledge, attitudes, practices, and compliance of rheumatic disease participants toward COVID-19 during the late pandemic who found that acceptable knowledge was detected among participants, However, they found some knowledge deficiencies in some aspects. Nicholas et al. (2020) who conducted study in Cameroon entitled "COVID-19 knowledge, attitudes and practices in a conflict affected area in south west of Cameroon" were in the same line with our study results stated that the majority of the study population had poor knowledge about COVID-19 infection.

On the contrary to our study findings Omer and Amer, (2020) who conducted a study in Egypt reported that 80.9% of the respondents have adequate knowledge about COVID-19. Also, in contrast to our study results El Mezayen and Elkazeh (2020) who

conducted a study entitled " Public's Knowledge, Attitude and Practices regarding COVID-19 Pandemic in Al Gharbia Governorate, Egypt" on 526 participants found that the most of the studied sample had good knowledge and only 11.0 % of them had poor knowledge.

Regarding attitudes of our participants, two thirds of them showed a positive general attitude toward COVID-19 infection these results were in line with Omer and Amer (2021) who reported that the participants, showed a positive general attitude toward the preventive measures taken by the government. The results also come in the same line with Kamal et al. (2024) who conducted a study entitled "Awareness of Participants with Systemic Lupus Erythematosus toward Prevention of COVID-19" reported that the majority of studied sample had positive total attitude toward prevention of COVID-19.

Regarding reported practice, our study findings showed that more than half of the study participants had a good practice toward COVID-19. This result was opposite to Omer and Amer (2021) who reported that the overall practice of COVID-19 preventive measures was poor among 785 (78.5%) of respondents. Our results come in accordance with Kamal et al. (2024) who reported that approximately half of the studied sample had adequate level of total practices toward prevention of COVID-19. This result also comes in the same line with Mohammed et al. (2020) who carried out a study at Saudia Arabia about "Knowledge,

Attitude and Practice toward COVID-19 among the Public in the Kingdom" and found that half of the studied sample had adequate level of practices toward prevention of COVID-19. From the investigator point of view this study was conducted during the height of the spread of the epidemic, and presence of poor knowledge about coronavirus disease lead to in adequate practice toward it.

The discrepancy between insufficient knowledge, good practice and positive attitude from the investigator point of view; may be related to disease (SLE) process and that signs and symptoms of systemic lupus affect greatly participants' immunity and lead to more health deterioration which interferes with participants' desire to know about other health risks like COVID-19. But at the same time they could follow instructions and specific preventive measures about COVID-19 in order to save themselves from more deterioration especially they suffer low immunity. Moreover, psychological factors, such as motivation and self-efficacy, may also play a role in shaping health behaviors.

Regarding the socio-demographic characteristics of the study sample the results demonstrated that, the majority of study sample were female, and their mean age 31.9±9.7 current study findings agrees with Kamal et al. (2024) who found that more than three quarter of study sample were female, and less than half of all sample's age ranged from 30 to less than 45 years old. These results were also similar to the result of study in Tanta University performed by Said et al. (2022) on 90

participants diagnosed with Systemic Lupus Erythematosus and found that more than half of the studied sample was in the age group of 20-< 35 years, most of the studied sample were female. Also, this result comes in the same line with Tharwat et al. (2021) who conducted their study in Mansoura University about "Challenges of Egyptian participants with Systemic Lupus Erythematosus during the COVID-19 pandemic, including 200 SLE participants aged > 18 years and proved that majority of study sample were female, with mean: SD age 30.1 ±8.4. Predominant finding of female gender was in accordance to the fact that women had higher incidence and prevalence of some specific autoimmune diseases than men did. (Widhani et al. 2020 and Kamal et al. 2024)

Regarding source of information about COVID-19 the study findings showed that the most frequent sources of information about COVID-19 infection among study participants was Television. This result comes in agreement with the results of a study done in Syria where the most common sources of information were TV. (International Federation of Red Cross and Red Crescent Societies; 2020). Also come in the same line with Widhani et al. (2020) Who carried out a study entitled " Factors Related to Knowledge, Perception, and Practices Towards COVID-19 Among Participants with Autoimmune Diseases: A Multicenter Online Survey" study done in Indonesia on 685 respondents, results revealed that leading main sources of information

about COVID-19 were television, doctor, and chatting application platforms. But our study results were inconsistent with the results of Omer and Amer, (2021) study which revealed that the most popular sources of information about COVID-19 infection among Egyptians were in order social media (Facebook, WhatsApp, and twitter) (64.5%), followed by international and governmental official websites (12.8%), Family members (12.4%), and (TV and radio) (6%).

Our study findings revealed that participants with previous COVID-19 infection had a significantly higher proportion of adequate knowledge than those without Previous COVID-19 infection (28.7% versus 11.2%, p-value=.027), this may be due to previous exposure of participants with systemic lupus to COVID-19 this enable patient to engage in process of COVID-19 infection let them to know about disease process and preventive measures of COVID-19 infection. Participants with longer disease duration had significantly higher adequate knowledge (p-value=.007). From the investigator point of view it could be explained as participants of longer duration with systemic lupus disease more keen to know about COVID-19 in order to save themselves from infection and more health deterioration. Also our study results revealed that participants taking information from friends had significantly lower knowledge. It may be related to misunderstanding and misconception about COVID-19 information derived from friends, so;

right information have to be taken from responsible health authority as medical personnel or awareness programs on TV. In our study the results presented that, there was no statistically significant relation between total knowledge about COVID-19 and socio-demographic characteristics of participants with Systemic Lupus Erythematosus such as gender, education, marital status. This result was disagree with Samir et al. (2020) who carried out the study in Tanta University about "Knowledge, Perceptions, and Attitude of Egyptians towards the Novel Coronavirus Disease (COVID-19)" who reported that, there was highly statistically significant relation between total knowledge about preventive measures of COVID-19 and socio-demographic characteristics of participants with Systemic Lupus Erythematosus such as gender and residence. Also our study results disagree with Kamal et al. (2024) who carried study in Kafr El shikh entitled "Awareness of Participants with Systemic Lupus Erythematosus toward Prevention of COVID-19" who revealed that there was a highly statistically significant relation between total knowledge about preventive measures of COVID-19 and socio-demographic characteristics of participants with Systemic Lupus Erythematosus such as age, educational level, job, and residence.

Our study results showed that participants with chronic disease had significantly lower positive attitudes than those without chronic disease, participants who received information from medical personnel had significantly higher positive attitudes, participants wearing masks had significantly higher positive attitudes, and that participants who had previous COVID-19 infection had significantly lower positive altitude. Our results come in agreement with Abdel Wahed et al. (2020) who carried out a study entitled "Assessment of Knowledge, Attitudes, and Perception of Health Care Workers Regarding COVID-19, A Cross-Sectional Study from Egypt" who reported that Physicians were the most often mentioned as a source of information about COVID-19 followed by the MOHP or WHO official web sites, and that hand washing, refrain from touching eyes, mouth and nose, and putting surgical face mask were among the preventive measures frequently accepted by participants.

Inconsistent to our findings, Kumar et al. (2020) found that health care workers' (HCWs) knowledge regarding the role of face mask in the prevention of the disease to be moderate to poor. Also, Olum et al. (2020) found about 17% of HCWs believed that wearing general medical masks was not protective against COVID-19. Also Abdelhafz et al. (2020) who found that about three-quarters of respondents believed that the face mask can protect against infection, just about 35% were ready to wear it.

Our study findings revealed that there was a significant positive correlation between attitude, knowledge, and practice score; in addition there was a significant positive correlation

between attitude and knowledge (p-value= <.001, .003 respectively). This result, comes in the same line with Kamal et al. (2024) who found that there was a highly statistically significant relation between total knowledge, practices, and attitude toward preventive measures of COVID-19.This results also agrees with El Mezayen and Elkazeh (2020) who revealed that statistically significant positive correlation was observed between total scores of knowledge, practice, and attitude of the participants of COVID-19 (p =. 0.000). This also corresponds with Reuben et al. (2020) who showed a significant (p < 0.05) relationship existing between good knowledge of COVID-19 amongst residents of north-central Nigeria and positive attitude towards COVID-19. Also, the study by Hanawi et al. (2020), who stated that the participants' high knowledge of COVID-19 translates into good and safe practices, during the COVID-19 pandemic, which suggests that the practices of Saudi residents are very cautious. Moreover, Melesie Taye et al. (2020) found that the individuals' knowledge on COVID-19 prevention was positively and significantly correlated with their practice.

According to the KAP model, knowledge is the basis and attitude is the driving force of behavior change. Therefore, improving people's knowledge and positive attitudes towards epidemic prevention are indispensable for improving protective behavior to fight against the COVID-19 pandemic. (Kang et al. 2023 and Giao et al. 2020)

Our results showed that participants receiving information from television, medical personnel, and friends had significantly higher good practice (p-value= .004, <.001, <.001 respectively), participants wearing masks (p-value= <.001), and receiving COVID-19 vaccination (p-value= <.001) had significantly higher practice. These results were in the line with Study findings by Hammad et al. (2019) reported that there was a statistically significant difference between both groups regarding going outdoors, wearing masks and gloves outdoors, where participants seemed to be more self-protecting. Kumar et al. (2020) and Vaidya et al. (2020) reported that the practice of preventive measures among the majority of participants, like wearing a mask were (94.7%) of participants. Also, Omer and Amer (2021) reported that most respondents used face masks when going to public gathering and practicing proper hand hygiene as preventive measures in reducing the chances of being infected. Our study findings were consistent with the results of a study in Syria where the most common sources of information were TV (66.4%). (International Federation of Red Cross and Red Crescent Societies, 2020) Also come in the same line with Widhani et al. (2020) and Abdel Wahed et al. (2020) who revealed that leading main sources of information about COVID-19 were television, doctor, and chatting application platforms.

Our study findings revealed that there is correlation between disease duration as independent factors and knowledge

score, p value (.007), and that there was correlation between receiving information from medical personnel and attitude and practice scores p value (<.001) In addition, participants with previous COVID-19 infection, and participants with shorter disease duration had significantly good practice. Over time, patient compliance may change. As the disease condition becomes stable, some participants have the potential tendency of noncompliance, including but not limited to medication and rehabilitation exercises Kang et al.(2023). Also Tran & Ravaud (2020) found that individuals with chronic conditions may have distorted perceptions of their risk of severe illness with COVID-19. In relation to correlation between receiving information from medical personnel and attitude and practice scores, our study findings come in line with Alshareef et al. (2021) who conducted a study in KSA, investigated different sources of information and its influence on the attitudes and adaptation of preventive actions; indicated that the respondents mainly relied on social media to obtain information related to COVID-19, followed by the MOH and television and newspapers. Social media as a main source of information was shown to negatively influence attitudes and compliance to preventive measures; on the contrary, a positive influence on both attitudes and practices was found among respondents using the MOH as a main source of information. Television and newspapers as a source of information was also shown to have a negative influence on participants' attitudes.

Conclusion:

Our study findings have shown that the level of the knowledge about COVID-19 infection of the most participants was generally inadequate. Also about two thirds of participants had a Positive attitude toward COVID-19 and that half of the participants had a good practice toward COVID-19 preventive measures. Independent factors affecting knowledge score were disease duration, and independent factors affecting attitude and practice score was receiving information from medical personnel. There was a significant positive correlation between attitude, knowledge, and practice score; in addition there was a significant positive correlation between attitude and knowledge.

Recommendations:

Based on the results of the current study the following recommendations are suggested: Health education guidelines should be provided about prevention of COVID-19 for patients with Systemic Lupus Erythematosus and circulate it at rheumatology units and autoimmune diseases clinics. In-service training programs should be designed for nurses in rheumatology units and outpatients clinics to conduct training sessions for patients with SLE about preventive measures of COVID-19 infection. Mobile application should be used to educate follow-up patients regarding signs, symptoms and transmission routes and preventive measures of COVID-19 infection.Follow-up studies are

recommended to see long-term impacts of COVID-19 infection in patients with Systemic Lupus Erythematosus.

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