

## Women's Awareness about Post Covid-19 Syndrome

Asmaa Abdel Halim Mosaad<sup>1</sup>, Hanan Ibrahim Ahmed<sup>2</sup>, Walaa Abdel Kader Mohamed<sup>3</sup>

<sup>1</sup> Teacher of Fayoum Nursing School,

<sup>2</sup> Professor of Community and Family Health Nursing, Faculty of Nursing, Ain Shams University,

<sup>3</sup> Lecturer of Community and Family Health Nursing, Faculty of Nursing, Ain Shams University

### Abstract

**Background:** The coronavirus disease (COVID-19), caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection, is leading to unknown and unusual health conditions that are challenging to manage. Post-COVID-19 syndrome is one of those challenges, having become increasingly common as the pandemic evolves. Post-COVID Conditions are a wide range of new, returning, or ongoing health problems that people experience after being infected with the virus that causes COVID-19. The WHO is a set of 'signs and symptoms that emerge during or after an infection consistent with COVID-19, persist for more than 12 weeks, and are not explained by an alternative diagnosis' **Aim:** The aim of the present study was to assess women's knowledge, practice, attitude related to post covid-19 syndrome. **Design:** A descriptive analytical study design was utilized. **Setting:** The study was conducted at two health unit (Ebheet Elhagr and Sennors medical units) at Fayoum governorate. **Sample:** A purposive sample of (230) women according certain criteria; who aged 20-50 years and contracted covid-19. **Tools of data collection:** three tools was used for data collection. An Interviewing questionnaire to assess knowledge, reported practice of women regarding Post covid-19 syndrome and attitude Likert scale to assess attitude of women regarding Post covid-19 syndrome. **Results:** The study revealed that the 80% had unsatisfactory level of knowledge about Post covid-19 syndrome, about 90.4% had satisfactory practice towards Post covid-19 syndrome, 43.5% of the study group had a positive attitude towards Post covid-19 syndrome, 56.5% had negative attitude. **Conclusion.** There were a statistical significant difference between women's education, occupation, family income and total women's knowledge. And women with satisfactory knowledge show a satisfactory level of practice while there was no significant association between attitude and knowledge level and there was no significant association between attitude and reported practice level. **Recommendation:** health educational program for women's to enhance knowledge, practices and attitude regarding to COVID syndrome through design health educational program, brochure and booklets.

**Key words:** Women's Awareness , Post covid-19 syndrome.

### Introduction:

The corona-virus disease (COVID-19), caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection, is leading to unknown and unusual health condition that are challenging to manage (Ghinai et al., 2020). Post-COVID-19 syndrome is one of those challenges, Post-COVID Conditions are a wide range of new, returning, or ongoing health problems that people experience after being infected with the virus that causes COVID-19. Most people with COVID-19 get better within a few days to a few weeks after infection, so at least four weeks after infection is the start of when Post-COVID Conditions could first be identified, Anyone

who was infected can experience Post-COVID Conditions (Jimeno et al., 2021).

A review of the literature reveals a wide range of terms for post-COVID-19 conditions: post-COVID-19 syndrome, post-acute COVID-19 syndrome, chronic COVID-19, long-term effects of COVID-19, long COVID-19, and post-acute sequelae of SARS-COV-2 infection. All these terms and others indicate that, following COVID-19 illness, the person lacks a return to a usual state of health. Many scientists are investigating and searching for the causes of these symptoms, why and when they occur, and how to treat them (Oronsky et al., 2021).

The UK National Health Service (NHS) defined the post-COVID-19 syndrome as unexplained, persisting signs or symptoms over 12 weeks, developed during or after the COVID-19 infection. Prolonged COVID-19 is commonly used to describe signs and symptoms that continue or develop after acute COVID-19. It includes continuous symptomatic COVID-19, called ongoing symptomatic COVID-19 (4 to 12 weeks), and post-COVID-19 syndrome ( $\geq 12$  weeks). (National Institute for Health and Care Excellence., 2020).

Researchers and clinicians have proposed numerous general pathophysiological mechanisms for post-COVID-19 syndrome based on the severity of the illness, the organs affected by the virus, immunologic abnormalities and inflammatory damage, virus-specific pathophysiological changes, and oxidative stress. (Pierce et al., 2022).

### Operational Definition of awareness

awareness refers to being aware of something and being aware of it; awareness refers to the state or ability of noticing, feeling, or being aware of events, objects, or sensory patterns. (Rachel et al., 2019).

### Significance of the study:

The latest estimates suggest that 10 to 20% of the SARS-CoV-2 patients who undergo an acute symptomatic phase are experiencing effects of the disease beyond 12 weeks after diagnosis (Amaya., 2020).

Studies show that around 10–20% of people infected by SARS-CoV-2 may go on to develop symptoms that can be diagnosed as long COVID. Although exact numbers of those living with the condition are uncertain, it is believed that more than 17 million people across the WHO European Region may have experienced it during the first two years of the pandemic (WHO., 2022).

In Egypt there are a study of post-COVID 19 symptoms in Egyptian patients which its results show Three hundred and ninety-six participants filled in the survey. The

mean age of participants was 41.4 years. Most participants had mild to moderate COVID-19 (81.31%). The prevalence of post-COVID-19 symptoms was 87.63%, where Female sex, the presence of comorbidities, lower degree of education, longer disease duration, as well as severe and critical forms of the disease were significantly associated with the presence of post-COVID symptoms. (Abdelhafiz et al., 2022)

Early in the COVID-19 pandemic, it was noted that severity of acute illness, rates of intensive care admission, and COVID-19-related mortality were greater among male patients than female patients (Lancet., 2020). whereas the opposite trend was observed with long COVID syndrome, where females are more often affected (Phillips et al., 2020).

### Aim of the study:

The study aims to assess the women's awareness about post covid-19 syndrome.

This is aim was achieved through

- Assess women's knowledge related to post covid -19 syndrome.
- Assess women's reported practices related to post covid19 syndrome.
- Assess the women's attitude related to post covid 19 syndrome.

### Research question

Is there a relation between the women's socio-demographic characteristics and the knowledge about post COVID 19 syndrome.

Is there a relation between women's knowledge level and their reported practices related to prevention of post- covid 19 syndrome?

Is there a relation between women's knowledge and attitude toward post covid 19 syndrome?

Is there a relation between women's reported practices and their attitude toward post covid 19 syndrome ?

## Subjects and methods:

**This study was portrayed under four main designs as following:**

- 1- Technical design.
- 2- Operational design.
- 3- Administrative design.
- 4- Statistical design.

### I. Technical design

The technical design include research design, The setting of the study, the subjects and the tools used for data collection.

#### Research design

Analytical research design was utilized to fulfill the aim of this study

#### Setting

This study was conducted at in two health unit (Ebheet Elhagr and sennors medical units) at Fayoum governorate because it is cover a large area of cities.

#### Subjects:

**-Type of sample:** purposive sample

**-Sample criteria:** the sample selected in the study according to certain criteria; women who aged above 20 years old and who have contracted COVID-19. **-Sample size:** the estimated sample size is 230 women were included in the study during a period of July 2022 until the end of December 2022.

#### Tool of data collection

**Tool 1: Interviewing Questionnaire tool:** the investigator developed questionnaire sheet after reviewing the current related literature. it was written in a simple Arabic language, it was divided into two parts and consisted of (26) questions of multiple choice type and close end questions,

**The first part** included demographic characteristics of the study subjects such as, age, marital status, education, income, etc...

**The second part** include Assess of women's knowledge related to post covid19 syndrome including questioner about definition, causes, risk factors, sign and symptoms, treatment , preventive measures, and complication(physical ,mental, social and psychological complication). It was adapted by the researcher.

#### ❖ Scoring system

- The score ranged from zero to one , for correct knowledge =(1) and for incorrect knowledge =(0). These scores were summed and were converted into a percent score.

-it was classified into 2 categories:

\*Satisfactory knowledge if The score  $\geq 60\%$ .

\*Un satisfactory knowledge if The score  $< 60\%$ .

#### Tool 11: women's reported practice questioner

It was modified by the investigator and translated into Arabic language to help women understand and easy fulfill statement to assess reported practice of women regarding post covid-19 syndrome. it contained (23) question (WHO, 2021)

#### ❖ Scoring system

The score ranged from zero to one , for done reported practice =(1) and for not done reported practice =(0)

-it was classified into 2 categories:

\*Satisfactory practice if The score  $\geq 50\%$ .

\*Un satisfactory practice if The score  $< 50\%$ .

### **Tool 111: Responses to attitudinal statement questionnaire**

A Likert scale is used to measure women's attitude toward post covid-19 syndrome and it was modified by investigator.(Al-Dossary et al., 2020).

#### **❖ Scoring system**

It calssified as "agree" , "some times" , "dis agree" and will be respectively scored 3, 2 and 1. The total score of the items will be summed up and will be converted into a percentage scores

- Positive attitude if the Total attitude score was more than or equal 70 percent
- Negative attitude if the total attitude was less than 70 percent was negative attitude

### **II. Operational design;**

The operational design included preparatory phase, content validity, pilot study and field work.

#### **\*Preparatory phase:**

It included reviewing of related literature, and theoretical knowledge of various aspects of the study using books, articles, internet periodicals and magazine, to develop tools for data collection.

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

It was established by a panel of five experts in Community health nursing specialty who reviewed the tools for clarity, relevance, comprehensiveness, applicability and according to their opinions and comments modification was done.

#### **\*Pilot Study**

A pilot study was carried out on 10% of total sample to test study process and to evaluate the applicability, clarity, feasibility and efficiency of the tools , determine the time required to fill the data collection tool. And find

the possible obstacles and problems that might face researcher and interfere data collection. The necessary modification was done according to the result of the pilot study. The subjects included in the pilot study were excluded from the study sample.

#### **Field work**

- The purpose of the study was explained simply to women.
- The investigator was available 2days per week: to collect data from women.
- The investigator started by introducing him self to women , gave a clear and brief idea about the aim of the study and its expectations..
- All women who participated in the study fulfilled the inclusion criteria, were given tool I(An interviewing questionnaire sheet to assess personal data and knowledge related to post covid-19 syndrome.
- Attitude likert scale (tool III) was given to assess women's attitude regarding post covid-19 syndrome and gave guidance to fill the questions when needed.

### **III.Administrative design**

An official approval with written letter clarifying, the purpose and the setting of the study was obtained from the director of the faculty of nursing at Ain Shams University and the directors of (Ebheet Elhagr and sennors medical units) at Fayoum governorate.

### **Ethical considerations**

- The approval for data collection from the women was obtained and the researcher clarified the aims, the objectives and expected outcomes from the study.
- The investigator tried hard to avoid injury to the research subject
- The Subject or The investigator could stop the study if any problem occurred
- women informed that they were allowed to choose to participate or not in the study and

that they had the right to withdraw from the study at any time, ethics, values, culture and beliefs were respected.

#### IV. Statistical design

Data collected and coded to facilitate data manipulation and double entered into Microsoft Access and data analysis performed using the Statistical Package of Social Science (SPSS) software version 22 in windows 7 (SPSS Inc., Chicago, IL, USA)

Simple descriptive analysis in the form of numbers and percentages of qualitative data, and arithmetic means as central tendency measurement, standard deviations as a measure of dispersion of quantitative parametric data

##### -For quantitative data

Independent samples **T TEST** was used to compare quantitative measures between two independent groups.

One –way **ANOVA TEST** was used to compare quantitative measures between more than two independent groups of quantitative

##### -For qualitative data

- **Chi square** test was used to compare two of more than two qualitative groups.
- **Bivariate Pearson correlation test was used** to test the association between variables.
- Tested by **Cronbach's alpha** test of reliability.
- **Reliability test** for questions included in questionnaire.
- The **P-value <0.05** was considered as statistical significant.

#### Results:

**Table(1):** illustrated that 46.5% of study group aged between 20 and 30 years old and  $X \pm SD$   $6.3 \pm 32$  , 40% educated to middle level, 52.6% were not working and 67.8% of the family income, was enough  $17.7 \pm 3.8$

**Table(2):** illustrated that 43.5% had a correct answer about post covid-19 syndrome definition, risk factors, treatment and social complication. 33.5% know about causes, 43.9% had knowledge about symptoms, 60.4% know about preventive measure, 43% knew mental complications, and 30% knew about psychological complications. all of them received information from the correct source.

**Table (3):**illustrated that 20% of women show a satisfactory level of knowledge,90.54% show satisfactory level of practice and 43.5% had a positive attitude toward post COVID syndrome. the mean knowledge score for each item that ranged between (0.2 and 1) with mean total knowledge of  $(5.04 \pm 1.9)$ .For practice scores it ranged between (1.9 and 5.5) with mean total practice score of  $(17.7 \pm 2.8)$ . For mean attitude score it was  $(18.1 \pm 2.5)$ .

**Table (4):** illustrated that , were a statistical significant difference between women education, occupation, family income and total women's knowledge  $\chi^2 = 65.6, 11.3, 50.4$  respectively and  $p = <0.005$

**Table (5):** illustrates that women with satisfactory knowledge show a satisfactory level of practice with p-value 0.01.

**Table (6):** illustrated that there was a statistical significance positive correlation between knowledge score and both reported practice and attitude scores with p-value  $<0.001$ , and  $0.01$  respectively. In addition there was a significant association positive correlation between attitude and reported practice scores with p-value 0.002.

**Figure (1):** illustrated that among study group, 43.50% had positive attitude level about covid-19 syndrome,56.50% had negative level of attitude about covid-19 syndrome.

**Table (1):** Distribution of different Women's General characters among study group.

Variables (n=230)	General characters	
<b>Mean <math>\pm</math>SD (range)</b>		
Age (years)	32 $\pm$ 6.3	20-50
<b>Woman's educational level</b>		
Illiterate	8	3.5%
Basic education	54	23.5%
Middle	92	40%
High	76	33%
<b>Mother occupation</b>		
work	109	47.4%
Not work	121	52.6%
<b>Income</b>		
Enough	156	67.8%
Not enough	66	28.7%
Enough and save	8	3.5%

**Table (2):** Distribution of women's Knowledge about post covid-19 syndrome among study group.

Knowledge about reproductive health (n=230)	Correct	
	No.	%
definition of post-Covid-19 syndrome	100	43.5%
causes of post-Covid 19 syndrome	77	33.5%
Risk factors	100	43.5%
most common symptoms with post-Covid 19 syndromes	101	43.9%
treatment for post-Covid 19 syndrome	100	43.5%
ways to prevent and reduce the post-Covid 19 syndrome	139	60.4%
physical complications of post-Covid 19 syndrome	45	19.6%
mental complications of post-Covid-19 syndrome	99	43%
psychological complications of post-Covid-19 syndrome	69	30%
social complications of post-Covid 19 syndrome	100	43.5%
source of your information about post-Covid 19 syndrome.	230	100%

**Table (3):** Distribution of women's Knowledge, practice and attitude about post-Covid 19 syndrome among study group.

Variables (n=230)	Frequency		X- $\pm$ SD
	No.	%	
<b>Knowledge</b>			
Unsatisfactory (>60%)	184	80%	5.04 $\pm$ 1.9
Satisfactory (<60%)	46	20%	
<b>Practice</b>			
Unsatisfactory	22	9.6%	17.7 $\pm$ 3.8
Satisfactory	208	90.4%	
<b>Attitude</b>			
Negative	130	56.5%	18.1 $\pm$ 2.5
Positive	100	43.5%	

**Table (4):** The relation between demographic characteristics and total women's' knowledge level about post Covid syndrome in different among study groups.

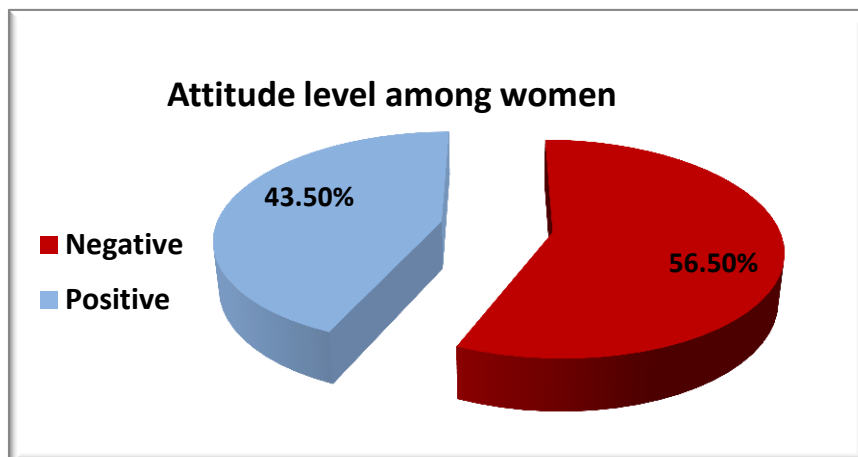
Variables	Knowledge level (N=230)				X <sup>2</sup>	P-value	Sig.
	Unsatisfactory (n=184)		Satisfactory (n=46)				
<b>Age groups</b>							
20-30 yrs	92	50%	15	32.6%	6.6	<b>0.03</b>	<b>S</b>
31-40yrs	60	32.6%	16	34.8%			
41-50 yrs	32	17.4%	15	32.6%			
<b>Women's educational level</b>							
Illiterate	8	4.3%	0	0%	65.6	<b>&lt;0.001</b>	<b>HS</b>
Basic education	54	29.3%	0	0%			
Middle	84	45.7%	8	17.4%			
University	38	20.7%	38	82.6%			
<b>Women's occupation</b>							
work	77	41.8%	32	69.6%	11.3	<b>0.001</b>	<b>HS</b>
Not work	107	58.2%	14	30.4%			
<b>Family Income</b>							
Enough	118	64.1%	38	82.6%	50.4	<b>&lt;0.001</b>	<b>HS</b>
Not enough	66	35.9%	0	0%			
Suffice and save	0	0%	8	17.4%			

**Table (5):** The relation between total knowledge and practice about post Covid syndrome.

Variables	Knowledge level (N=230)				X <sup>2</sup>	P-value	Sig.
	Unsatisfactory (n=184)		Satisfactory (n=46)				
<b>Practice</b>							
Unsatisfactory	22	12%	0	0%	6.1	<b>0.01</b>	<b>S</b>
Satisfactory	162	88%	46	100%			

**Table (6):** Correlation between women's knowledge, reported practice and attitude scores towards post-Covid 19 syndrome.

Variables	Total knowledge score		
	r	P-value	Sig.
Total reported Practice score	<b>0.35</b>	<b>&lt;0.001</b>	<b>HS</b>
Total attitude score	<b>0.17</b>	<b>0.01</b>	<b>S</b>
Total attitude score	<b>0.20</b>	<b>0.002</b>	<b>HS</b>



**Figure (1):** women's total attitude level about post-covid-19 syndrome.

### Discussion:

As regard to age of the studied women, the current study result illustrated that less than half of study group aged between 20 and 30 years old. This result was in the same line with *Kim et al.,(2022)* who applied study among in Korea among 241 participants entitled "Post-acute COVID-19 syndrome in patients after 12 months from COVID-19 infection in Korea" and found that highly percentage of the studied patients their age was <50.

As regard to educational level, the current study result showed that, two fifths of the studied women's educated to middle level. This result was in contrasted with *Tran et al., (2022)* who applied study among 1859 patients in France entitled "Course of post COVID-19 disease symptoms over time in the Compare long COVID prospective e-cohort and found that 15% low percentage of them had middle level of education.

The current study result found that more than half of them were not working, and more than two thirds of the family income was enough income. (Table 1). This result was in disagreement with *Ursini, et al.,(2021)* who applied study among 616 participants in Italy entitled "Fibromyalgia:

a new facet of the post-COVID-19 syndrome spectrum " and found that 79.4% highly percentage of the studied patients were employed

As regard to correct knowledge about post-covid19 syndrome, the current study result showed that, 43.5% less than half of them had a correct answer about COVID syndrome definition, risk factors, treatment and social complication, 33.5% one third of them had correct answer about causes, 43.9% more than two fifths of them had knowledge about symptoms, 60.4% less than two thirds of them had correct answer about preventive measure, 43% more than two fifths of them had correct answer mental complications, and 30% less than one third of them had correct answer about psychological complications. All of them received information from correct sources, This result was contrasted with *Yazdi et al.,(2022)* who found that 94% of the studied women had knowledge about symptoms, 87.5% of them had knowledge about prevention and treatment. Also in disagreement with *Abuidhail et al., (2022)* who applied study in Jordan among 370 mothers entitled "Knowledge and practices of breastfeeding mothers towards prevention of the emerging corona virus (COVID-19)" and found that 99% of them had correct knowledge about of preventive measures. And contrasted with *Goshiye et al.,(2020)* who applied study in Ethiopia among 634 mothers entitled "Knowledge, Attitude, and Practice towards COVID-19 among Mothers in Dessie Town, Northeast Ethiopia" and found that 72% of the mothers had good knowledge about covid 19.

As regard to positive attitudes of the studied women about post-covid19 syndrome,



the current study result illustrated the different agreement level among study group about their attitude towards post COVID syndrome which ranged between 13% and 90.4%, This result was contrasted with *Erfani, et al.,(2020)* who applied study among 8591 participants in Iran entitled "Knowledge, Attitude and practice toward the novel coronavirus (COVID19) outbreak" and found 60% of them had a favorable attitude towards COVID-19.

Concerning correlation between women's knowledge, practice and attitude, the Covid 19 syndr-scores towards post current study result illustrated that there was a statistical significance positive correlation between knowledge score and both reported value -practice and attitude scores with p and 0.01 respectively. In addition there <math>P < 0.001</math> association positive correlation was a significant a -between attitude and practice scores with p value 0.002. This result was similar with the *et al Rahmatillah* study done by.,(2022) who a significant correlation found that there was and 19-between knowledge regarding COVID .(value 0,001-preventive behaviour (P

### Conclusion:

About one fifty of the studied women had good level of knowledge about covid-19 syndrome, majority of them had poor level of knowledge, while majority of them had good reported practice level and less than one fifty of them had poor reported practice level. Also less than fifty percent of them had positive attitude level about covid-19 syndrome, more than half of them had negative level of attitude about covid -19 syndrome. Additionally there were a statistical significant difference between women's education, occupation, family income and total women's knowledge. And women with satisfactory knowledge show a satisfactory level of reported practice while there was no significant association between attitude and knowledge level and there was no significant association between attitude and reported practice level.

**Based on the findings of the present study, it can be concluded that:**

- 20% of the studied women had good level of knowledge about covid-19 syndrome, 80% of

them had poor level of knowledge, while 90.4% of them had good practice level and 9.6% of them had poor practice level.

- 43.50% of them had positive attitude level about covid-19 syndrome, 56.50% of them had negative level of attitude about covid -19 syndrome.
- Additionally there were a statistical significant difference between woman's education, occupation, family income and total woman's knowledge.
- women with satisfactory knowledge show a satisfactory level of reported practice while there was no significant association between attitude and knowledge level and there was no significant association between attitude and reported practice level.

### Recommendations:

Based on the study finding, it was recommend the following:

- Health educational program(HEP) for women's to enhance knowledge, practices and attitude regarding to COVID syndrome through design health educational program, brochure and booklets
- Additional research using different training programs for nurses to be well prepared to provide women with appropriate knowledge and practices about COVID syndrome through verbal and written instructions
- This study results should be repeated with a larger probability sample size in a different geographic location to confirm the findings.

### References:

- Abdelhafiz AS, Ali A, Ziady HH, Maaly AM, Alorabi M, Sultan EA(2022).** Prevalence, Associated Factors, and Consequences of Burnout Among Egyptian Physicians During COVID-19 Pandemic. *Front Public Health.* 2022 ;8:590190. Published 2022 Mar 31. doi: 10.3389/fpubh.2022.590190
- Abuidhail, J., Tamim, F., Abdelrahman, R. Y., & Al-Shalabi, E. (2022):** Knowledge and practices of breastfeeding mothers towards prevention of the emerging corona

- virus (COVID-19). *Global Pediatrics*, 2, 100024.
- Al-Dossary, R., Alamri, M., Albaqawi, H., Al Hosis, K., Aljeldah, M., Aljohan, M.,... & Almazan, J. (2020).** Awareness, attitudes, prevention, and perceptions of COVID-19 outbreak among nurses in Saudi Arabia. *International journal of environmental research and public health*, 17(21), 8269.
- Amaya(2020).**<https://sciprofiles.com/profile/author/ZnFOVmhvMExYRDZGeURISm1KcWZmRFdjaFF3ZFMvb1FIaDZhUk5xc1doST0=amaya.jimeno@carm.es>
- Erfani A, Shahriarirad R and Ranjbar K(2020):**“Knowledge, Attitude and practice toward the novel coronavirus (COVID19) outbreak: a population-based survey in Iran,” *PLoS One*, vol. 15, 2020.
- Goshiye D, Abegaz Z, Gedamu S(2020):**Knowledge, Attitude, and Practice towards COVID-19 among Mothers in Dessie Town, Northeast Ethiopia, 2020. *Interdiscip Perspect Infect Dis*. 2022 Oct 19;2022: 4377460. doi: 10.1155/2022/4377460. PMID: 36313383; PMCID: PMC9605845.
- Lancet(2020).**..The gender dimension to COVID-19. *The Lancet*. 2020;395(10231):1168.
- National Institute for Health and Care Excellence;(2020).** SIGN. Royal College of General Practitioners COVID-19 Guideline Scope: Management of the Long-Term Effects of COVID-19; NICE: London, UK, 2020; pp. 1–7.
- Oronsky B., Larson C., Hammond T. C., Oronsky A., Kesari S., Lybeck M., Reid T. R. (2021).**A review of persistent post-COVID syndrome (PPCS). *Clinical Reviews in Allergy & Immunology*, 1–9. 10.1007/s12016-021-08848-3.
- Phillips S, Williams MA(2021).** Confronting our next national health disaster – long-haul CovidJanghorban, R., & *N Engl J Med*. 2021;385(7):577–579.
- Pierce, J. D., Shen, Q., Cintron, S. A., & Hiebert, J. B. (2022).** Post-COVID-19 syndrome. *Nursing research*, 71(2), 164-174.
- Rachel A Caspar, Judith T. Lessler, and Gordon B. Willis Gordon B. Willis. (2019):** Reducing Survey Error through Research on the Cognitive and Decision Processes in Surveys. Short course presented at the 2019 Meeting of the American Statistical Association. Research Triangle Institute.
- Rahmatillah Razak,Anggun Budiastuti , Nurmalia Ermi,(2022):** Determinant of preventive behavior covid-19 among mothers in ogan ilir regency, south sumatera indonesia *Jurnal Ilmu Kesehatan Masyarakat*, Mar2022, 13(1):62-72 e-ISSN 2548-7949 DOI: <https://doi.org/10.26553/jikm.2022.13.1.62-72>
- Tran, VT., Porcher, R., Pane, I. (2022):**Course of post COVID-19disease symptoms over time in the ComPaRe long COVID prospective e-cohort. *Nat Commun* 13, 1812 (2022). <https://doi.org/10.1038/s41467-022-29513-z>
- Ursini, F., Ciaffi, J., Mancarella, L., Lisi, L., Brusi, V., Cavallari, C.,... & Meliconi, R. (2021):**Fibromyalgia: a new facet of the post-COVID-19 syndrome spectrum? Results from a web-based survey. *RMD open*, 7(3), e001735
- World Health Organization ((2022** [.https://www.who.int/europe/news-room/fact-sheets/item/post-covid-19-condition](https://www.who.int/europe/news-room/fact-sheets/item/post-covid-19-condition)
- Yazdi M, Bemanalizadeh M, Mohebpour F, Goli P, Daniali SS, Kelishadi R(2022):**Latent Class Analysis of knowledge, Attitude, and Practice of a Population-Based Sample of Iranian Pregnant Women toward COVID-19. *Adv Biomed Res*. 2022 Jun 29;11:52. doi: 10.4103/abr.abr\_271\_21. PMID: 35982858; PMCID: PMC9379920.