Assiut Scientific Nursing Journal
http://asnj.journals.ekb.eg
http://www.arabimpactfactor.com
http://olddrji.lbp.world/indexedJournals.aspx
DOI: 10.21608/ASNJ.2022.156113.1417

Blended Learning via Distance Effects on Nurses' Performance, Perception, and Anxiety during COVID-19 Pandemic

Manar Fathy Hamza[1], Eglal Hassaneen Abdel Hakeim[2], Mohga Fathy Hamza[3] & Amira Mohammed Ali Hassan[4],
[1.] Assistant professor, Adult Health Nursing, Faculty of Nursing, Helwan University, Egypt.
[2.] Assistant professor, Adult Health Nursing, Faculty of Nursing-King Salman International University, Egypt.
[3.] Lecturer of Psychiatric, Mental Health Nursing, Faculty of Nursing, Cairo University, Egypt.
[4.] Lecturer, Medical Surgical Nursing, Faculty of Nursing, Suez Canal University, Egypt

Abstract
Background: COVID-19 and subsequent global crisis lockdowns have initiated a sudden need for learning to be blended. Nurses are the frontline healthcare staff, providing direct care to individuals affected with COVID-19 **Aim:** This study aimed to determine the blended learning via distance effects on nurses' performance, perception, and anxiety during the COVID-19 pandemic. **Design:** Quasi experimental design was used. **Setting:** The study was conducted in the inpatients department at one of the biggest university hospitals affiliated with Cairo University in Egypt. **Sample:** A convenient sample of total 100 nurses allocated to the previously mentioned settings. **Tools:** Six tools were used to collect data including I: self-administered questionnaire B- Nurse's knowledge assessment questioner, II: Nurses self-reported checklist, III: nurses' attitude response, IV: Nurses' risk perception response, V: Generalized Anxiety Disorder 7-item (GAD-7) and VI: Nurses' opinionnaire. **Results:** There was a highly statically significant difference between pre and post implementation of the blended learning training program with (P>0.001) which revealed an improvement in the study subject's performance. Also, there was a positive attitude, and positive risk perception among nurses regarding COVID-19, with an overall improvement in the level of anxiety regarding dealing with the current pandemic. Most studied nurses were satisfied regarding implementation of the blended learning training program. **Conclusion:** The finding of the study concluded that nurses' performance was improved post- implementation of the blended learning intervention with satisfaction among the nurses regarding the new method of learning. **Recommendations:** It is highly recommended to increase nurses' awareness through using the electronic resources.

Keywords: Blended learning, Nurses' performance, Nurses' perception & Nurses' anxiety

Introduction
Coronavirus disease 2019 (COVID-19) is an extremely infectious viral illness caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as it had a terrible effect on the world's demographics, resulting in more than 3.8 million mortality worldwide, making it the most significant global health crisis since the 1918 influenza pandemic **(Rajnik, et al., 2021).** After the first cases of this mostly respiratory viral illness were reported in late December 2019 in Wuhan, Hubei Province, China, SARS-CoV-2 quickly spread throughout the world, prompting the World Health Organization **(WHO)** to declare it a global pandemic **on March 11, 2020**.

The COVID-19 had ravaged many countries and overwhelmed many healthcare systems since it was declared a global pandemic. COVID-19, is a transferrable disease because of the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It is a global pandemic. With high infectious, fatality rate greater than 1%, with no actual antiviral therapy or vaccine. But the mainstay of pandemic management controlled and mitigation it **(Zhu et al., 2020).**

The risk of infection, pandemics and outbreaks have a psychological effect on health care workers; they attend as a front line directly involved in caring for treating patients, causing work under marvelous pressure. The health care workers (HCWs) are at risk of having psychological distress and developing other mental health symptoms **(Alhurishi, et al., 2021)**. Factors such as uncertainty, an increasing number of cases and death, overwhelming workload, fear of contamination, and social isolation as a result of fear of infecting others, especially family members, stigmatization and discrimination, and shortage of personal protective equipment (PPE), may lead to psychological problems among the health care workers. These difficulties result in adverse mental health outcomes that are not only detrimental to HCWs' well-being, but may also decrease their ability to address efficiently the emergency health **(Park, et al. 2018)**.

The COVID-19 pandemic has caused changes in many aspects of life, particularly in education, where learning must be conducted on a regular and up-to-date basis **(Rohmani, et al. 2021).** Furthermore, lessons that were previously taught in the classroom are now taught via virtual meetings online in order to prevent the virus from spreading further. Everyone is expected to adapt to the use of modern technology and the Fourth Industrial Revolution, particularly educators and students **(Abidah et al., 2020**).

Egyptian education bodies adopted the use of online and blended learning many years before the COVID-19 pandemic. Efforts were being made to involve technology in teaching, designing online courses, in order to train staff and students on the best use of e-learning services and tools. As, at least 150 countries have closed schools and instructive education affecting over 80% of the world's understudy population**.** In specific, the COVID-19 pandemic forced colleges to move their entire instructional traditional system to an alternative online distance one **(Dhawan, 2020).**

Blended learning is the mix of face-to-face learning and synchronous e-learning to gain of its advantages over traditional learning. Blended learning is a promising solution for medical education. This learning approach has grown in popularity in academics and is now extensively employed especially during the COVID-19 pandemic **(Vallée et al., 2020).**

Nurses play a pivotal role in the provision of safe, individualized, holistic, and actual care to their patients through the application of the nursing process. It has been predicted that adequate knowledge, practice, and attitude are acquired during the nurses' training needs that apply to the day-to-day care of their patients through applying evidence-based nursing care practices and improving nurses' competency (**Jordan et al., 2021).**

Nurses may have varied perceptions of COVID-19, and thus may perform different clinical management strategies, leading to different results. Nurses need to develop a solid foundation of the disease process to play a greater role to control the disease. How nurses observe and respond to COVID-19 is dangerous to expedite positive results. Another contributing factor that affects personal perception about the disease is their attitude toward the disease **(Hessels et al., 2019)**. According to **(Serrano, Hassamal, Hassamal, Dong, Neeki, 2021)** possible causes of elevated anxiety among nursing staff regarding COVIiD-19 pandemic may be attributed to their scope of practice and exposure to patients with COVID-19 patients. Lack of educational resources and insufficient support due to the worrying environment and working conditions may also be consider a contributing factor.

Significant of the study:

The novel coronavirus disease 2019 (COVID-19) has been recognized as one of the most critical pandemics and catastrophic diseases that happened in human history, with many fatalities and morbidities globally that happened daily scientist arise in December 2019 and continue until June 2020. But on 5 of June 2020, WHO reported that confirmed COVID-19 cases have exceeded 6.6 million globally, with over 391,000 fatalities and more than 2.87 million recoveries worldwide **(Soltan, et al.2020).**

In Egypt, by the beginning of April 2020, there were over 800 cases were positively diagnosed as COVID-19 infection, with more than 50 fatalities, and a rapid tendency to rise **(Abdelhafiz, et al., 2020).** Over about1 month, the number of diagnosed cases rises enormously to reach 31,115 cases on 5 June 2020, with about1166 fatality cases, a hurdle that could be the reason of anxiety and fear among the community **(Egyptian statistics on COVID-19 2020).**

Lack of knowledge and improper attitudes among nurses could directly influence practices and lead to delayed diagnosis, poor infection control practice, and the spread of the disease. Understanding nurses' knowledge, practice attitudes, and possible perception of the risk of infection support to expectations of the outcomes of COVID-19 and helps in establishing appropriate strategies to alleviate their anxiety and improve nurses' efficiency care in Egypt **(Ammar, & Ramadan, 2020)**.

The COVID-19 pandemic has required alternative strategies to sustain high-quality nursing education. So, it is important, during the pandemic, for graduate nurses, and nursing students to have continuous interaction, communication, and update them-self with the new guidelines to deal with COVID-19. In addition, the nurse needs to acquire new technology skills and uses of the internet as an educational source (**Lim, 2021).**

Operational definition of risk perception:

Risk perception regarding COVID-19 is the feeling toward this disease. It is new virus, infectious, and fatal. Nurses were afraid from infection to them self and their families.

Aim of the study:

The study aimed to determine the blended learning via distance effects on nurses' performance, perception and anxiety during COVID-19 pandemic.

Research Hypothesis:

Blended learning via distance effects will has a positive effect on nurses' performance, perception and anxiety during COVID-19 pandemic.

Material and Methods:

Study design

A quasi-experimental design was utilized to accomplish this study's purpose. ONE GROUP (pre-posttests)

Participants and sample size

The study participants including all adult male and female nurses who were caring for patients with COVID-19 and working in the selected setting. A sample of 100 nurses who accept to participate in the study over six months **(Beginning of December 2020 to the end of May 2021)**. Excluding the nurses who did not attend during the study period because of sick leave. The sample size was calculated using EpiCalc with 95% confidence and 5% marginal error.

The study setting

The study was conducted in the inpatients department at one of the biggest university hospitals affiliated with Cairo University in Egypt. The inpatient's departments are the place in which receive and care for patients with COVID-19

Instruments

Six tools were used to collect the data including

I. Self-administered questionnaire: which includes two parts

A. **Nurse's demographic characteristics,** it was designed by the researchers in Arabic language to gather the baseline characteristics of the nurses like (age, gender, education, direct contact with patient with COVID-19 or not, main source of knowledge regarding COVID-19, previous infection control training courses, and any previous experience in dealing with serious infectious diseases).

B. **Nurse's knowledge assessment questionnaire,** It developed by the researchers in Arabic language after reviewing the related literature (CDC, 2020, Tand Ammar &Ramadan, 2020) to assess the nurse's knowledge regarding COVID-19 It consists of seven main parts (nature, signs and symptoms, high risk group, method of transmission, method of prevention, complications, and treatment).

The scoring system of this tool: the tool consists of 7 parts each part contains the number of questions answered with yes or no, the total questions were 38 grads. Yes, equal one grade and no equal zero with the total score of 38 grades. The satisfactory level is calculated as ≥ 80 % (31/38) while < 80% considered unsatisfactory.

II. Nurses' self-reported checklist:

It was adapted from the guidelines of WHO and CDC (2020) to assess the nurse's practice in caring of patients with COVID-19 for hospitalization. Cronbach's alpha was done and scored 0.82. This tool was consisting of 11 steps of practicing concerning by the protective measures against COVID-19; each step was checked as done or not done.

The Scoring system

One grade was gives for the done step and zero for the not done step with total score 11. The competent level was calculated as ≥80% (9/11) while the incompetent was <80%.

III. Nurses' attitude response:

It was developed by the researchers after extensive literature reading **(Abd-Elhamed &Hasab Allah, 2021, Abdel Wahed & Hefzy, 2020)** in the Arabic language to assess the nurse's attitude toward COVID-19 as a preventable disease and measures taken by the Egyptian ministry of health to overcome the pandemic. The tool consists of 10 items in a 5-point Likert scale recorded as: strongly agree (5 points), agree (4 points), neutral (3- points), disagree (2 points), and strongly disagree (1 point) with a total score of 50 points. A mean score ≥ 30 (answering for strongly agree or agree) was described as a positive attitude, and the score of 10 to 30 indicated a negative attitude (answering strongly disagree, disagree, neutral).

IV. Nurses' risk perception

It was developed by the researchers after massive literature reading **(Abd-Elhamed & Hasab Allah, 2021 &, Abdel Wahed & Hefzy, 2020)** in the Arabic language to assess nurses' feelings towards COVID-19 infection by two statements: 1) I am more susceptible to infection as compared to others, 2) I am afraid of being infected with COVID-19 virus. The response could be either yes or no. causes of risk perception of more susceptibility to COVID-19 or perception of fear from catching COVID-19 were encountered.

V. Generalized Anxiety Disorder 7-item (GAD-7).

It was adopted from **(Spitzer, Kroenke, Williams, et al, 2006),** to measure nurse' anxiety levels during confronting COVID-19 pandemic. The GAD-7 score is calculated by assigning scores of 0, 1, 2, and 3, to the response categories of 'not at all', 'several days', 'more than half the days', and 'nearly every day', respectively, and adding together the scores for the seven questions with total score ranged from (0-21). Scores of 5, 10, and 15 are taken as the cut-off points for mild, moderate and severe anxiety, respectively.

VI. Nurses' opinionnaire regarding blended and distance learning.

It was developed by the researchers after reviewing literature **(Kaplan & Haenlein, 2016)**, to assess nurse's opinions toward blended and distance learning as method of teaching this tool ranged from 5= strongly agree, 4= agree, 3= fair, 2= disagree, 1= strongly disagree.

Validity and reliability:

Content validity of the tools were checked by five experts from Medical-Surgical nursing specialty. Modifications were done based on their recommendations.

The reliability of the tools were conducted by Chronbach alpha test which showed 0.82

Ethical considerations

Official approval and permissions from the director of the hospital and the heads of the departments were obtained. All the participants gave informed consent through Google form after being given full explanations about the study's aims and benefits. It was clarified that participation in the study was voluntary. The confidentiality of participate was secure through the coding of all data. In addition, the participants were informed that they could refuse or withdraw from the study at any time without giving any reason.

Pilot study

A pilot study was conducted before starting the main study data collection on 10 nurses to assess the recruitment feasibility, and the applicability of the tools, as well to estimate the time to fill in the tools. as well to estimate the time needed to fill in the tools. Participants who shared in the pilot study were included in the main study sample. Since there was no difference in the recruitment process. The results of the pilot study established that the study was feasible.

Statically analysis:

The data were entered, tabulated and analyzed using Statistical Package of Social Sciences (SPSS) program version 25. Quantitative data appeared as mean and standard deviation (Mean ±SD) where student t-test and Mann-whiteny test were used for comparison between pre and post in one group of normally distributed and not normally distributed variables respectively. Differences were considered significant at P-value <0.05.

Procedure of data collection, the study was conducted in three phases:

Egypt during COVID-19 pandemic was on lockdown because of the disease and home isolation. So the researchers decide to use the online and distance data collection methods by using the Google form, WhatsApp, and Zoom app for teaching the nurses.

1. **Assessment phase:** One of the researchers interviewed the nurses online (Zoom meeting) and explained the study's aim in order to obtain their digital informed consent and collect the demographic characteristics. The nurses are divided into 5 groups, each group consists of 20 nurses and the researcher meets each group twice (1st time for consent and the second time to assess the attitude, anxiety and risk perception. The pretest of the knowledge was converted to Google form and the link was sent to the nurses at another time. Additionally, the self-reported checklist was sent to the nurses to fill it pre starting the intervention phase, the nurses fill it in a Google form also to be easy for them. The time of assessment phase took about two months to finish (from the beginning of December 2021 to the end of January 2021).
2. **Intervention phase**: At this phase, two of the researchers describe the steps of dealing with patients with COVID-19 and presentation about COVID-19 and its nature, the preventive methods, and way of transmission. The presentation and the procedure were described in the zoom meeting in separate 2 sessions each session took about 30 minutes to be concise and directed to safe time of the nurses in the quarantine. The nurses are divided into 5 groups, each group consists of 20 nurses, and each group attends two sessions, one for the theoretical information and the other one for the practical part. The steps of practice are described in a video recorded by the researchers and send on the participants WhatsApp to be available all-the time and in a short, as the video length was 15 minutes. This phase starts at the beginning of February 2021 and ended of April 2021.
3. **Evaluation phase**: The researchers reassessed the nurse after implementation of the **blended and distance learning sessions of** the study information by assessing nurses level of knowledge using Google form and send the link to the nurses. Regarding the practice the self-reported checklist was send again to the nurses to assess the reported practice. Additionally, the anxiety level was measured also. Finally, the opinionnaire sheet also sends to the nurse to take their opinion regarding the methods of teaching.

The researchers assess attitude only before the program because the change in attitude takes a long time. This study was conducted during the epidemic of COVID-19, and data collection was not taking a long time.

Resutls:

Table (1): Frequency distribution of the studied sample regarding their demographic characteristics (n= 100)

	N	%
Sex		
- Male	58	**58.0**
- Female	42	42.0
Age		
- 20<29	38	38.0
- 29<39	42	**42.0**
- 39<49	12	12.0
- ≥50	8	8.0
Mean ±SD **35.2±8.4**		
Education		
- Postgrad level	6	6.0
- University level	10	10.0
- Technical institute	62	**62.0**
- Diploma in nursing science	22	22.0
Direct contact with patient		
- Yes	58	**58.0**
- No	42	42.0
Main source of knowledge about CVID-19		
- MOHP and WHO website	22	**22.0**
- Social media	42	**42.0**
- Newspaper	4	4.0
- Television	4	4.0
- Physician	28	28.0
- Friends/family	0	0.0
- Courses	0	0.0
Infection control Training courses		
- Yes	54	**54.0**
- No	46	46.0
Last infection control course since…..		
- < 3 months	4	4.0
- 3< 6 months	10	10.0
- 6< 12 months	19	19.0
- ≥ 12 months	21	**21.0**
Previous experience in dealing with serious infectious diseases		
- Yes	40	**40.0**
- No	60	60.0

Table (2): Nurse's satisfactory level of knowledge regarding coronavirus disease 2019 (COVID-19) before and after implementation of the blended and distance learning sessions (n=100)

Nurse's knowledge	Pre	Post	t	P
	Mean ±SD	Mean ±SD		
1- Nature of the COVID-19	5.4±**1.02**	6.42±**.70**	8.98	**0.000****
2- Signs and symptoms of COVID-19	8.12±**1.83**	11.12±**0.62**	10.19	**0.000****
3- High risk group for COVID-19	4.14±**1.01**	5.22±**0.81**	5.77	**0.000****
4- Method of transmission of COVID-19	3.08±**0.77**	3.60±**0.53**	4.51	**0.000****
5- Method of prevention of COVID-19 transmission	2.52±**0.61**	2.82±**0.38**	3.65	**0.001***
6- Complications of COVID-19	3.14±**0.60**	3.46±**0.64**	4.10	**0.000****
7- Treatment of COVID-19	1.42±**.49**	2.00±**0.00**	8.22	**0.000****

Statically significant P>0.5* * highly statistically significant P>0.001*

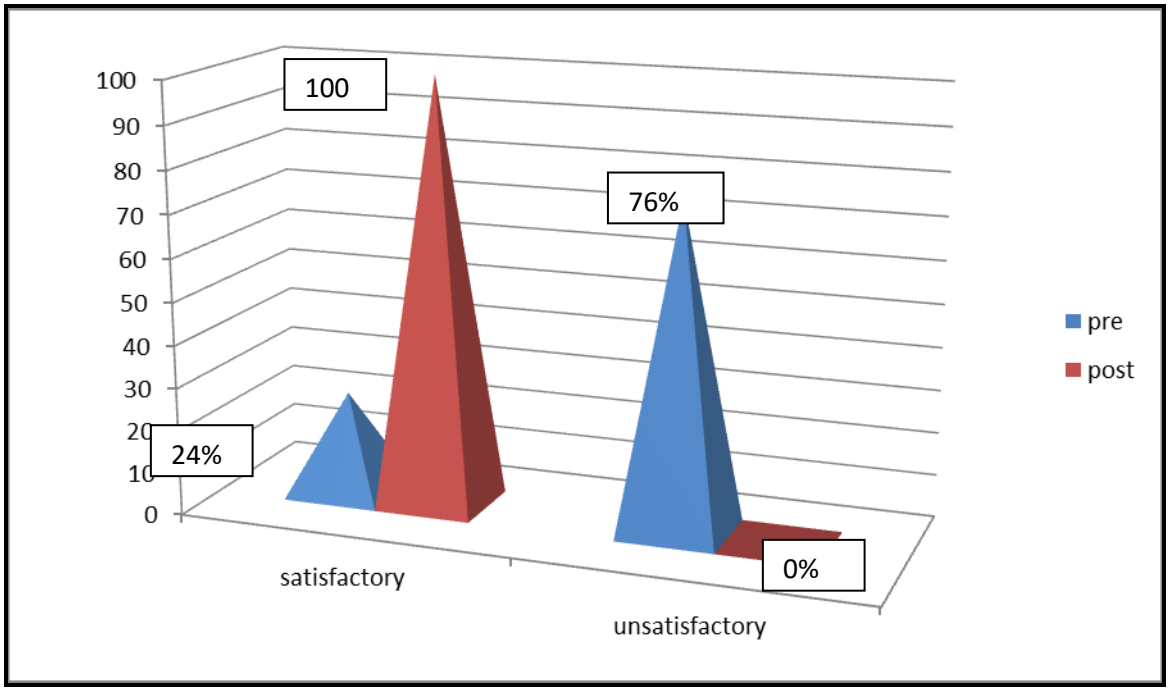

Figure (1): Percentage distribution of the studied sample regarding to their total level of knowledge regarding Covid-19 (n=100)

Table (3): Nurse's competent level of practice regarding coronavirus disease 2019 (COVID-19) before and after implementation of the blended and distance learning sessions (n=100)

Step	Pre				Post				t	p
	Done		Not Done		Done		Not Done			
	N	%	N	%	N	%	N	%		
1-Wash hands with soap, water and alcohol	100	100.0	0	0.0	100	100.0	0	0.0	16.18	0.000**
2-Avoid touching eyes, nose and mouth	52	52.0	48	48.0	76	76.0	24	24.0	16.51	0.000**
3-Putting on facemask	100	100	0	0.0	100	100.0	0	0.0	3.93	0.000**
4-Covering the nose and mouth while coughing	44	44.0	56	56.0	92	92.0	8	8.0	6.72	0.000**
5-Avoiding crowdedness in public places	44	44.0	56	56.0	90	90.0	10	10.0	6.46	0.000**
6-Frequently cleaning and disinfecting surfaces	54	54.0	46	46.0	100	100.0	0	0.0	6.46	0.000**
7-Keep at least one meter distance between people	50	50.0	50	50.0	92	92.0	8	8.0	5.95	0.000**
8-Washing nose with a salty solution	28	28.0	72	72.0	80	80.0	20	20.0	7.28	0.000**
9-Avoid direct contact with others	78	78.0	22	22.0	86	86.0	14	14.0	2.06	0.044
10- Discard the PPE in an appropriate way	86	86.0	14	14.0	100	100.0	0	0.0	2.82	0.007
11- Washing hands when touching contaminated object	86	86.0	14	14.0	100	100.0	0	0.0	2.82	0.007
Mean ±SD	7.22±1.37				10.16±0.11				16.18	**0.000****

Statically significant P>0.5* * highly statistically significant P>0.001*

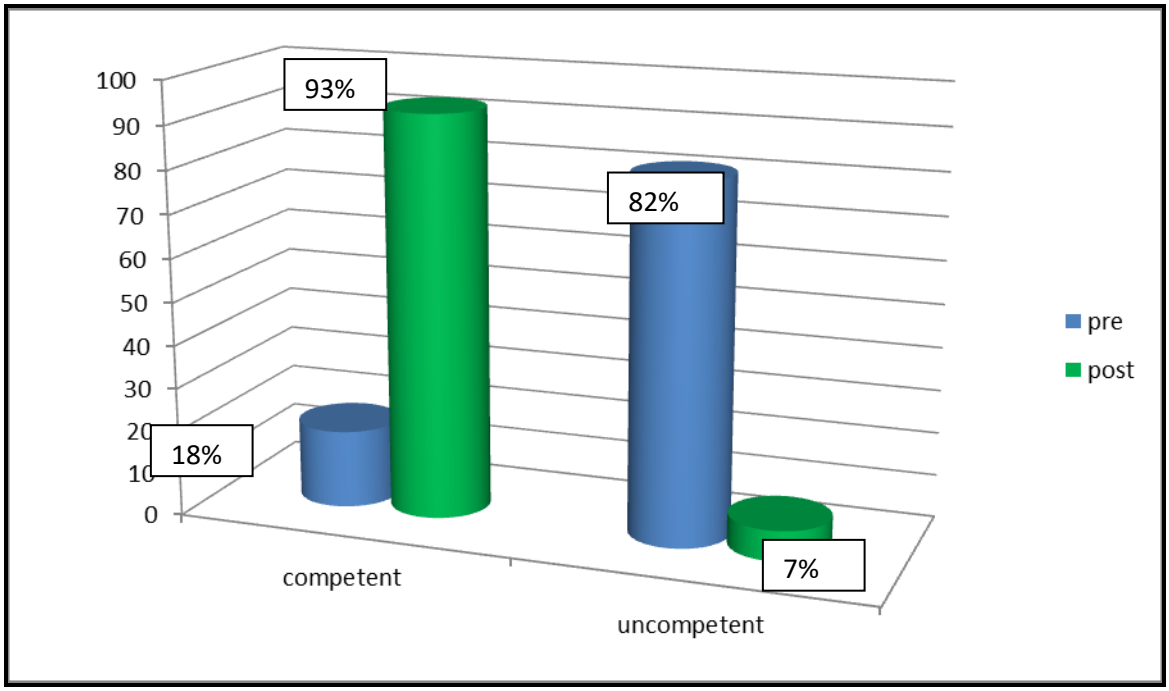

Figure (2): Percentage distribution of the studied sample regarding to their total level of practice regarding Covid-19 (n=100)

Table (4): Nurse's attitude regarding coronavirus disease 2019 (COVID-19) (n=100):

Item	Strongly agree		Agree		Neutral		Disagree		Strongly disagree		Total
	N	%	N	%	N	%	N	%	N	%	
1- COVID-19 is a severe disease	68	**68.0**	32	32.0	0	0.0	0	0.0	0	0.0	4.68±.47
2- COVID-19 can be prevented	22	22.0	44	**44.0**	34	34.0	0	0.0	0	0.0	3.88±.74
3- Standard precaution can protect us against COVID-19	**62**	62.0	32	32.0	4	4.0	0	0.0	0	0.0	4.59±.57
4- COVID-19 cases will increase	4	4.0	8	8.0	8	8.0	46	**46.0**	34	34.0	2.02±1.5
5- I am confident that Egypt can overcome COVID-19	36	36.0	38	**38.0**	22	22.0	4	4.0	0	0.0	4.06±.86
6- I am confident in the information disseminated by the MOPH about COVID-19	38	38.0	42	**42.0**	20	20.0	0	0.0	0	0.0	4.18±.74
7- There are cases recovered from disease	4	4.0	8	8.0	16	16.0	62	**62.0**	10	10.0	2.34±.91
8- Regulation taken by the government are enough to combat disease	54	**54.0**	42	42.0	2	2.0	2	2.0	0	0.0	4.48±.64
9- COVID-19 is accurately diagnosed	0	0.0	26	26.0	44	**44.0**	30	30.0	0	0.0	2.96±.75
10-I am agree to have a COVID-19 vaccine	10	10.0	32	32.0	38	**38.0**	20	20.0	0	0.0	3.32±.91
Total attitude											36.42±2.34

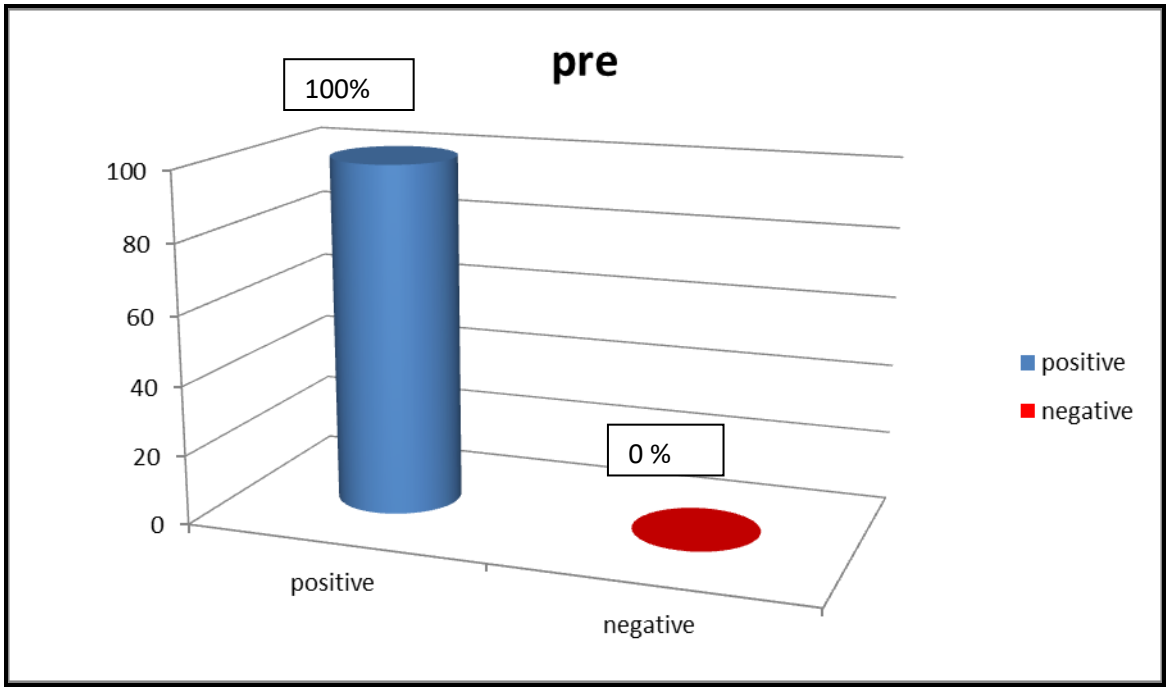

Figure (3): Percentage distribution of the studied sample regarding to their total attitude level regarding Covid-19 (n=100)

Table (5): Nurse's risk perception regarding coronavirus disease 2019 (COVID-19) (n=100):

Statement	Yes		Statement	Yes	
	N	%		N	%
1- It's a new diseases with unknown treatment	84	84.0	9- It's a new emerging disease with limited data about it	80	80.0
2- It's a new disease with unknown vaccine	80	80.0	10- The PPE is not always available	78	78.0
3- The disease is highly transmissible	84	84.0	11- I am not well accustomed to use the PPE	84	84.0
4- The disease may be fatal	88	88.0	12- I am not well trained to use the PPE	82	82.0
5- I could transmit infection to my family	88	88.0	13- The PPE is not enough to protect from infection	94	94.0
6- I have comorbidities	78	78.0	14- The crowdedness in the work place is suitable for transmitting infection	88	88.0
7- The public stigmatizes those who get infection	80	80.0	15- The ventilation in the work place is suitable for transmitting infection	80	80.0
8- Fear of entering isolation hospital	78	78.0	16- The public is not committed to the preventive measures	80	80.0

Table (6): Mean level of Nurses' Generalized Anxiety Disorder 7-item (GAD-7). Before and after implementation of the blended and distance learning sessions (n=100)

Items	Before	after	t	P-value
	Mean ± SD	Mean ± SD		
1. Feeling nervous, anxious, or on edge	**1.9±0.8**	**0.6±0.6**	12.65	0.0001
2. Not being able to stop or control worrying	**1.7±0.8**	**0.8±0.7**	8.90	0.0001
3. Worrying too much about different things	**1.8±0.8**	**0.9±0.6**	9.14	0.0001
4. Trouble relaxing	**1.6±0.8**	**1.02±0.5**	6.21	0.0001
5. Being so restless that it's hard to sit still	**1.6±0.7**	**0.9±0.6**	6.52	0.0001
6. Becoming easily annoyed or irritable	**1.6±0.8**	**0.9±0.6**	6.63	0.0001
7. Feeling afraid as if something awful might happen	**1.7±0.8**	**1.04±0.7**	6.90	0.0001
Total score	12.13±**3.5**	6.38±**1.86**	14.96	0.0001

Statically significant P>0.5* * highly statistically significant P>0.001*

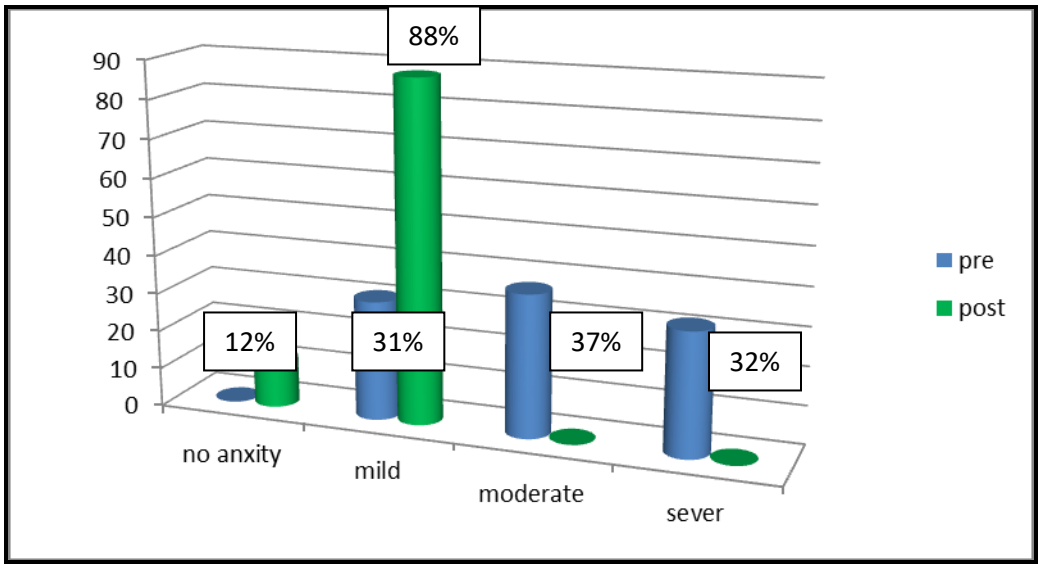

Figure (4): Nurses' level of anxiety in confronting Covid-19 (n=100)

Table (7): Nurse's opinion toward distance learning (n=100):

Nurse's opinion	Strongly agree 5		Agree 4		Fair 3		Disagree 2		Strongly disagree 1		Total
	N	%	N	%	N	%	N	%	N	%	
1. Satisfied with the scientific material	16	16.0	50	**50.0**	24	24.0	4	4.0	6	6.0	2.54±0.85
2. Distance learning is better than being in physical attendance	18	18.0	36	**36.0**	32	32.0	10	10.0	4	4.0	2.32±0.82
3. I interact well with colleagues and teachers in distance learning more than physical attendance	8	8.0	50	**50.0**	36	36.0	3	3.0	3	3.0	2.59±0.95
4. I feel comfortable studying at a distance because I am learning at my own pace and according to my ability	18	18.0	24	24.0	40	**40.0**	10	10.0	8	8.0	2.40±0.73
5. I really enjoy with distance learning experience	4	4.0	46	**46.0**	42	42.0	4	4.0	4	4.0	2.59±0.99

Table (1): Revealed that 58% of the study sample was male with mean age 35.2±8.4, and regarding to the education 62% had an intermediate education (technical institute). Also 58% of the nurses dealing with patients in direct contact, while 42% of them receive their information from social media while 22% receive it from MOHP and WHO website. Regarding infection control courses 54% of nurses attend infection control courses and 21% of them attend the course for more than one year. Finally, just 40% of the study sample has experience in dealing with serious infections.

Table (2): Showed that there was a highly significant improvement of nurse's knowledge level about corona virus disease after implementation of the blended educational training.

Figure (1): Shows that there was an improvement in the nurse's knowledge level regarding COVID-19 with satisfactory level which improved from 24% in the pre stage to 100% in post implementation of blended educational training.

Table (3): Shows that there is a highly significant improvement in the total mean level to practice among the study sample regarding corona virus

disease before and after implementation of the blended educational training.

Figure (2): Represented the improvement in the nurse's practice level regarding COVID-19 and the competent level improved from 18% in the pre stage to 93% in post implementation of the blended educational training.

Table (4): Revealed that 68% and 54% of the study sample strongly agree that (COVID 19 is a series disease, and the regulation taken from the Egyptian government are enough to combat the disease). While 44%, 38%, and 42% of the sample agree that COVID-19 could be controlled, also they confident that Egypt could overcome COVID-19 and confident in the information disseminated by the MOPH about COVID-19). From point of view 44% and 38% of nurses not sure about (if the COVID-19 is accurately diagnosed or not, also they are not sure if they will receive the vaccine or not). In addition, 46% and 62% of the nurses disagree about (9the cases will increase, and there are cases recovered completely from the disease).

Figure (3): Represents the positive nurse's attitude regarding COVID-19 while 100% of them have a positive attitude regarding dealing with COVID-19 and the disease process itself

Table (5) Discussed the nurses' risk perception regarding COVID-19 and showed that 94% of them think that The PPE is not enough to protect from the infection, while 88% think that the disease may be fatal, as they transmit infection to their family and also believed that crowdedness in the work place is suitable factor for transmitting the infection.

Table (6): Discussed the nurse's level of anxiety regarding COVID-19 and showed that the total mean score of GAD-7 for nurses was 12.13±3.5 before implementation of the blended educational training in pre stage which reflects a high level of anxiety while the total mean score of GAD-7 post implementation of the blended educational training for nurses become 6.38±1.86 which reflected a mild level of anxiety.

Figure (4): Represents the nurse's level of anxiety in confronting COVID-19 was 37% of them had a moderate level of anxiety pre intervention while become 88% of them have a mild level of anxiety post intervention

Table (7): Showed that 50% of the nurses interact well with colleagues and teachers in distance learning more than physical attendance and satisfied with the scientific material. And 46% enjoy the distance learning experience, while 36% fined that the distance learning was better than being in physical attendance. Also 40% of the study sample feel comfortable while studying through the distance learning because they are learning at their own pace and according to their ability.

Discussion:

The spreading of the COVID-19 disease among nurses was overstated by overcapacity due to lack of isolation facilities, and contaminated environment with inadequate knowledge and awareness about infection control practices (**Wu, & McGoogan, 2020).**The nurses are at the frontline of COVID-19 pandemic defense and are exposed to, not only infection with COVID-19 due to their frequent exposure to infected individuals, but also they were anxious, all along the working hours, due to fatigability, occupational stigma and physical violence **(WHO, 2020 & Gan, et al. 2020).**

As regards characteristics of the study group, the study sample was one group of the nurse (pre &post). The finding of the current study showed that, about two third (58%) of the studied nurse were female. This finding was explained because the nursing filed in Egypt is common among females. The male nurses were recently joined nursing field through the Nursing Faculties. The mean age of the studied nurse was **35.2±8.4.** The previous finding was the same line with **Elasrag, et al. (2021)** in their study under the title impact of educational intervention on nurses' knowledge, practice and attitude related to prevention measures of COVID- 19, in Egypt, the means age of the study sample was 34.80±4.99. Two third (62%) of them hold deplume in nursing sciences from the technical institute of nursing, and (58%) of them had direct contact with the patient. Less than half (42%) of them their main sources of knowledge regarding COVID-19 were from the social media, and (28%) from the physicians. The interpretation of the previous finding may be due to COVID-19 was an epidemic and public health problem all over the world, so all the social media invited many physicians and discussing the preventive measures and mode of transmission.

In addition, WHO and MOHP shared a wide range of information available on the internet, which could easily guide the public. The previous finding was in the same line with **Gohel et al. (2021)** in study done under the title "Knowledge and perceptions about COVID-19 among the medical and allied health science students in India: An online cross-sectional survey". They discovered that; the majority of students det their knowledge about COVID-19 from the social media (65.17 %.) **Chan (2020)** in another survey conducted in Pakistan reported that social media (87.68%) of the participants get their knowledge from the social media. Regarding infection control, half of the nurses participated in infection control training courses, and (21%) of them attended the course for more than one year ago. Finally, less than half (40%) of the participants deal with serious infectious diseases.

Concerning nurses' knowledge, the current study showed that, there was a highly statistically significant improvement in the study sample's level of knowledge regarding all aspects of COVID-19 disease before and after implementation of the blended educational training with (P>0.001). The rational of the previous findings may be due to that the blended educational training carried out by the professional teams and all data and material was available to nurses which facilitates their gaining of knowledge. The previous finding was in the same line with **Alwani et al., (2021)**. In his study title evaluation of knowledge, practices, attitude, and anxiety of nurses towards COVID-19 during the current outbreak in Pakistan. They found that, nurses in Karachi have sufficient knowledge regarding different aspects of COVID-19 Moreover, different studies performed in different parts of the world showed strikingly similar results **Kamineni. et al. (2020),** mentioned that there was a highly significant difference between studied nurses' related correct answers about knowledge questions between pre and post intervention with (p <0.001). Contradictory to the findings of the current study, **Khan, et al. (2020),** he mentioned that research conducted in Pakistan reported a low level of knowledge among the nurses.

Regarding nurses' practice, this study found that, there was a highly statistically significant improvement in the total mean level of practice for nurses regarding COVID-19 before and after implementation of the blended educational training(P>0.001). Especially regarding washing hands, putting on a face masks, frequently cleaning and disinfecting of the surfaces, discarding PPE, and washing hands when touching contaminated objects all nurses (100 %) perform the previous steps correctly. The previous finding may be due to the effect of increasing awareness due to the training program implementation. In addition, COVID-19 was a new disease, and nurses were afraid to be infected so they follow all the preventative measures to protect them self and their family members. The previous finding was in the same line as **Elasrag, et al. (2021**), who founded highly statistically significant improvement regarding nurses reported practice. They showed that (36%) of nurses had competent practice level pre intervention increasing to (90%) post intervention with (P>0001). The previous finding was in the same line with **Ammar & Ramadan (2020)** in study under the title "effect of implementing distance learning on nurses' knowledge and practice regarding COVID-19 Pandemic". They illustrated that there was a highly statistically significant improvement in nurses' level of practice post implementation of the education than pre stage with (P>0001).

Regarding nurse attitude, the current study illustrated that, there was positive nurse total attitude toward COVID-19 pre implementation of the blended learning training program. More than half of the studied nurses (68%), (62%), and (54%) strongly agreed that COVID 19 is a severe disease, standard precautions could protect them against COVID-19, and regulations taken by the government are enough to overcome the diseases respectively. The previous finding was in the same line with Abdel **Wahed, et al. (2021)** in study title "assessment of knowledge, attitudes, and perception of health care workers regarding COVID-19, A Cross-Sectional Study from Egypt". They found positive attitude regarding COVID-19 among allied health workers more than physicians in many items. The majority of participants clarified that COVID-19 is a severe disease, and (95.6%) agreed that infection control standard precautions could protect against COVID-19. In addition, nearly (40%) of the physicians agreed that the regulation taken by the government is enough to combat the COVID-19 problem. On the other hand, less than half of the studied nurses (44%), (38%), (42%) agreed that COVID-19 could be prevented, as they were confident that Egypt could overcome COVID-19, and also, they were confident that the information disseminated by the MOH about COVID-19 The previous finding was in coherence with **Abdel Wahed, et al. (2021),** who added that allied health workers were agreed that this disease could be prevented. Although less than half of the studied nurses (44%), and (38%) were not sure that COVID-19 is accurately diagnosed and they didn't know they will revive vaccine or not respectively. In addition, less than half of studies nurses (46%) disagree that CODID-19 cases will increase. More than half of the studied nurses (62%) disagree that there were patients recovered from COVID-19.

Concerning nurses' risk perception regarding COVID-19 disease, this study mentioned that, the majority of studied nurses' (94%) think that, the PPE is not sufficient to protect them from the infection and (88%) of them they think that they may transmit infection to their family. From the researchers' point of view, it is a normal feeling for nurses, the disease is new, and they cannot deal with such issues before, nurses need support and safety in the working environment. Furthermore, it is necessary to provide sufficient, recurring training on the use of the personal protective equipment which adapted to nurses during pandemic. They need proper using of PPE and its effect to protect themself, family, and community. The previous finding was in the same line with **Jang, et al. (2021),** who found that most nurses have reported fear related to caring for patients

with COVID-19, and they also believed that they were inadequately protected, as PPE are not enough to protect them. Nurses have been reported to have higher COVID-19 infection risks than other health care workers. Nurses mentioned that hospitals need to supply adequate personal protective equipment at the request of emergency nurses and provide precise guidelines according to the type of personal protective equipment.

Most of the studied nurses' (88%), mentioned that, CODID-19 may be fetal. The previous finding was in incoherence with **Ning, et al. (2020)** in their study title the" impacts of knowledge, risk perception, emotion and information on citizens' protective behaviors during the outbreak of COVID-19: a cross-sectional study in China", they founded that most respondents considered the outbreak severe (94.4%). **Kwok (2020)** added that (97%) of the study sample in Hong Kong considered the outbreak serious. In the current study (88%) of the studied nurses mentioned that crowding in the working area is an appropriate environment for transmitting the infection. The previous finding was in the same line with **Ammar & Ramadan (2020), who found that** (61%) of the studied nurses mentioned that crowdedness in the work place is suitable for transmitting infection.

As regards to Nurses' Generalized Anxiety Disorder, the findings of the current the study indicated that a considerable proportion of study sample reported symptoms of severe and moderate anxiety, during the pre-stage. The results of the current study are in congruence with **Alhurishi et al., (2021)**, who assessed the level of depression, anxiety, insomnia and distress symptoms experienced among healthcare providers during the COVID-19 pandemic in Saudi Arabia, their main findings indicate that the majority of healthcare providers who worked during the COVID-19 outbreak showed symptoms of severe depression, anxiety, and distress. These findings supported go on with **(El-Azzab, & El-Nady, 2021)** who clarified that there was more than one-third of the studied nurses had severe anxiety pre- the psychoeducational program.

On the same line, in a cross-sectional study assessed the psychological disturbances among healthcare workers in Saudi Arabia and Egypt mentioned that more than half of them had anxiety and stress, while**(Arafa, Mohammed, Mahmoud, Elshazley, & Ewis, 2021). Serrano et al., (2021)** concluded that, possible causes of increased anxiety among nursing staff attributed to their scope of practice and contact with COVID-19 patients. Lack of educational resources and insufficient support and oversight by nursing staff due to the stressful environment and working area may also be contributing factors.

While the majority (88%) of nurses' level of anxiety decreased toa mild level with about (50%) deviation toward mild anxiety, and about (12%) reported no anxiety in the post implementation of the blended learning training program. This, reflects strong evidence that the nursing staff had benefited from the program in improving their knowledge and reducing their levels of anxiety. In the same line with the study implemented by **(Chen, Tian, Li, & Li, 2020).)** And **(El-Azzab, & El-Nady, 2021**who clarified that, providing intense education and training for nurses effective as the use of personal protective equipment. And concluded that "great positive effect" on reducing levels of anxiety & stress post implementation of educational session, among nurses accomplished the educational session, who care for patients infected with Coronavirus.

From the researchers' points of view, the overall improvement in the nurse's level of anxiety is open due to at least two interpretations. First, the course specifically focuses on improving studied nurses' knowledge and practice without direct contact or through distance learning which is more helpful to them in reducing their contacts and also saving their time. Second, this particular form of staff training may have a relatively specific effect on nurses' perception of this pandemic based on their knowledge improvement. The change in their perception may affect their level of anxiety toward dealing with those patients.

Regarding nurses' opinion toward distance learning the current study concluded that, half of the studied nurses (50%) were satisfied with scientific materials, and they interact well with their colleagues and teacher in distance learning than in physical. This reflects the importance of the internet in encouraging health, especially during infectious diseases and pandemics. Technology presence during these lock-down months plays an important role in providing knowledge and encouraging nurses to continue their education.

The previous finding is incoherence with **Khagi (2021)** in study title "perception of nursing students towards online learning during COVID-19 pandemic" who found that about (50%) of students agree that, they felt comfortable during interacting with other students in the online class and that the amount of interaction with the teacher in the class was appropriate. In addition, less than half of studied nurses (46%) they were enjoyed with the distance learning experience. The previous finding with the same line of **Alosta & Khalaf (2021**) in study title "nursing students' perception of E-learning during COVID-19 Pandemic; A literature review" who mentioned that the participants viewed distance learning as a good opportunity to continue education.

While (40%) of studied nurses they feel comfortable studying at distance because they learn at their place and according to their ability. The previous finding was in agreement with **Ammar and Ramadan (2020),** who illustrated that nearly all the studied nurses feel comfortable studying at distance learning at their own place and according to their abilities and apply what their learn through different communication channels.

Conclusion & Recommendations:

The current study concluded that there was a highly statistically significant improvement in the study sample level of knowledge and practice regarding all aspects of COVID-19 disease after blended educational training. As regards nurse attitude, the current study illustrated that, there was a positive nurse total attitude regarding COVID-19 pre blended learning training program. In addition, the nurses have high risk perceptions regarding COVID-19 regarding nurse's satisfaction to the new method of teaching, half of nurses were satisfied and had a positive opinion.

It is highly recommended to increase nurses' awareness regarding all electronic resources as WHO, MOHP and web site for the availability of many online courses regarding COVID-19 to continue to improving their knowledge, practice, and attitude. In addition, encourage nurses to develop their skills to use technology and the internet in the working environment. Implementation of a joint education and workforce training program to prepare frontline nurses with the arrangement to improve their well-being during COVID-19 as an effective approach to reduce anxiety.

References:

- **Abdel Wahed, W., Hefzy, E., Ahmed, M., & Hamed, N. (2020):** Assessment of Knowledge, Attitudes, and Perception of Health Care Workers Regarding COVID-19, A Cross-Sectional Study from Egypt, Journal of Community Health, Dec., https://doi.org/10.1007/s10900-020-00882-0
- **Abdelhafiz AS, Mohammed Z, Ibrahim ME, Ziady HH, Alorabi M, Ayyad M, (2020):** Knowledge, perceptions, and attitude of Egyptians towards the novel coronavirus disease (COVID-19). J Community Health;45(5):881–90 https://doi.org/10.1007/s10900-020-00827-7.
- **Abd-Elhamed, M., & HasabAllah, M., (2021):** Effect of Educational Program on Nurse's Knowledge, Practice and Attitude Regarding Covid -19 at Maternity Care, Units International Egyptian Journal of Nursing Sciences and Research (IEJNSR), 2(2): 432-445, DOI: 10.21608/ejnsr.2021.107069.1128 available at: https://ejnsr.journals.ekb.eg/article_212547_b94a303f6414cd6cbbd2c8aa781ef341.pdf
- **Abidah A, Hidaayatullaah HN, Simamora RM, Fehabutar D, & Mutakinati L. (2020):** The impact of COVID-19 to Indonesian education and its relation to the philosophy of "Merdeka Belajar" Stud Philos Sci Educ.;1:38–49. https://ejournal.upi.edu/index.php/IJOMR/article/view/33789
- **Alhurishi, S., Almutairi, K., Vinluan, J., Aboshaiqah, A., & Marie, M. (2021):** Mental health outcomes of healthcare providers during COVID-19 pandemic in Saudi Arabia: a cross-sectional study. Frontiers in Public Health, 9, 625523. Available at: https://www.frontiersin.org/articles/10.3389/fpubh.2021.625523/full
- **AlOsta, M., & Khalaf, I., (2021):** Nursing Students Perception of E-learning during COVID-19 Pandemic; A Literature Review. Medico Legal Update, 21(4), 269–277. https://doi.org/10.37506/mlu.v21i4.3141
- **Alwani, S., Majeed, M., Ramzan, Z., Rauf, S., Syed, M., Shah, S., Hirwani, M., & Hamirani, F. (2021):** Evaluation of Knowledge, Practices, Attitude, and Anxiety of Nurses towards COVID-19 during the Current Outbreak in Karachi, Pakistan. Pakistan Journal of Public Health, 10(2), 82–90. https://doi.org/10.32413/pjph.v10i2.601
- **Ammar, S., & Ramadan, S., (2020):** Effect of Implementing Distance Learning on Nurses Knowledge and Practice RegardingCovid-19 Pandemic, International Journal Of Nursing Didactics, December,10: (12)1-9, DOI: https://doi.org/10.15520/ijnd.v10i12.3171
- **Arafa, A., Mohammed, Z., Mahmoud, O., Elshazley, M., & Ewis, A. (2021):** Depressed, anxious, and stressed: What have healthcare workers on the frontlines in Egypt and Saudi Arabia experienced during the COVID-19 pandemic?. Journal of affective disorders, 278, 365-371.
- **Arif, Z., & Azhar, A. (2021):** Covid-19 Pandemic: Impact on skill improvement of the Indonesian teachers in using online learning applications. ELS Journal on Interdisciplinary Studies in Humanities, 4(4), 400-412. https://doi.org/10.34050/elsjish.v4i4.18753
- **Chan A, Nickson C, Rudolph J, Lee A, Joynt G. (2020):** Social media for rapid knowledge
- **Chen, X, Tian J, Li, G., & Li, G. (2020):** Initiation of a new infection control systemfor the COVID-19 outbreak. Lancet Infect Dis., [Epub ahead of print]. https: // doi. org/ 10. 1016/ S1473-3099(20)30110-9.

  Dissemination: early experience from the COVID-19 pandemic. Anesthesia.

- **Dhawan S. Online Learning: (2020):** A Panacea in the Time of COVID-19 Crisis. Journal of Educational Technology Systems. Sep;49 (1):5–22. doi: 10.1177/0047239520934018. PMCID: PMC7308790
- **Egyptian statistics on COVID-19 (2020):** Information and Decision Support Center in the Egyptian Cabinet 2020 [cited 2020 5 June]. https://www.care.gov.eg/EgyptCare/Index.aspx.
- **Elasrag, G., Elsabagh, N., Abdelmonem, A., & Ahmed, A. (2021):** Impact of Educational Intervention on Nurses' Knowledge, Practice and Attitude Related Prevention Measures of COVID 19. In Indian Journal of Forensic Medicine & Toxicology (15), 3,2939-2948
- **El-Azzab, S., & El-Nady, M. (2021):** Effectiveness of Psycho-Educational Program to Alleviate Depression, Anxiety, Stress, Pessimism and Provide Optimism for COVID-19 Isolation Nurses. Egyptian Journal of Health Care, 12(2), 965-980. doi: 10.21608/ejhc.2021.173651. Available at: file:///C:/Users/Marwan/Downloads/Covid19programDr.SaedaDr.Mona.pdf
- **Gan, W., Lim, J., & Koh, D. (2020):** Preventing intra-hospital infection and transmission of COVID-19 in healthcare workers. Safety and Health at Work, 11, 241
- **Gohel KH, Patel PB, Shah PM, Patel JR, Pandit N, Raut A. (2021).** Knowledge and perceptions about COVID-19 am\ong the medical and allied health science students in India: An online cross-sectional survey. Clin Epidemiol Glob Health. Jan-Mar; 9:104-109. Doi: 10.1016/j.cegh.2020.07.008
- **Hessels, A., Kelly, A., Chen, L., Cohen, B., Zachariah, P., & Larson, E. (2019):** Impact of infectious exposures and outbreaks on nurse and infection preventionist workload. American journal of infection control, 47(6), 623–627. https://doi.org/10.1016/j.ajic.2019.02.007
- **ltaybani, S., Abdelhalim, G., & Abdelgawad, M. E. (2021):** Nursing students' and educators' experience with e-learning during a pandemic: An online survey. In Nursing Forum (Vol. 56, No. 4, pp. 878-888).
- **Jang, Y., You, M., Lee, S., & Lee, W. (2021):** Factors associated with the work intention of hospital workers' in South Korea during the early stages of the COVID-19 outbreak. Disaster Medicine and Public Health Preparedness, 15(3), e23–e30. https://doi.org/10.1017/dmp. 2020.221
- **Jordan, P., Iwu-Jaja, C., Mokoka, E., Kearns, I., Oamen, B., de Lange, S., & Naidoo, V. (2021):** Development of a training programme for professional nurses in South Africa–An educational response to the COVID-19 pandemic. Nursing Open.
- **Kamineni SRT, Balu P, Sivagananam P, Chellapandian P, Chelladurai UM, Jayasheelan VP, (2020):** Knowledge of COVID-19 among nursing and Allied health care professionals working in tertiary care hospital. International Journal of Research in Pharmaceutical Sciences. 2020;11(SPL1):103-9
- **Kaplan, A.M. & Haenlein, M. (2016):** Higher Education and the Digital Revolution: About MOOC, SPOCs, Social Media, and the Cookie Monster. Business Horizons, 59, 441-450. https://doi.org/10.1016/j.bushor.2016.03.008
- **Khagi, B., Panthee, B., Pun, K., & Shrestha, S. (2021):** Perception of nursing students towards online learning during COVID-19 pandemic. Journal of Patan Academy of Health Sciences, 8(2), 63–71. https://doi.org/10.3126/jpahs.v8i2.31432
- **Khan S, Khan M, Maqsood K, Hussain T, & Zeeshan M. (2020):** Is Pakistan prepared for the COVID-19 epidemic? A questionnaire-based survey. Journal of Medical Virology.
- **Kwok KO.** Community responses during the early phase of the COVID-19 epidemic in Hong Kong: risk perception, information exposure and preventive measures. Emerg Infect Dis. 2020;26(7):1575–9
- **Lim, S. (2021):** Content analysis on online non-face-to-face adult nursing practice experienced by graduating nursing students in the ontact era. Journal of the Korea Academia-Industrial cooperation Society, 22(4), 195-205. https://www.koreascience.or.kr/article/JAKO202113855736399.page
- **Ning, L., Niu, J., & Bi, X. (2020):** The impacts of knowledge, risk perception, emotion and information on citizens' protective behaviors during the outbreak of COVID-19: a cross-sectional study in China. BMC Public Health **20**, 1751 (2020). https://doi.org/10.1186/s12889-020-09892-y
- **Park, J., Lee, E, Park, N., & Choi, Y. (2018):** Mental health of nurses working at a government-designated hospital during a MERS-CoV outbreak: a cross-sectional study. Archives of psychiatric nursing, 32(1), 2-6. Available at https://www.sciencedirect.com/science/article/pii/S0883941717300444
- **Rajnik, M., Cascella, M., Cuomo, A., Dulebohn, S. C., & Di Napoli, R. (2021):** Features, Evaluation, and Treatment of Coronavirus (COVID-19). Uniformed Services University Of The Health Sciences. https://www.ncbi.nlm.nih.gov/books/NBK554776/ (accessed on 19 December 2021)
- **Rohmani, N., & Andriani, R. (2021):** Correlation between academic self-efficacy and burnout

originating from distance learning among nursing students in Indonesia during the coronavirus disease 2019 pandemic. Journal of educational evaluation for health professions, 18, 9. https://doi.org/10.3352/jeehp.2021.18.9

- **Serrano J, Hassamal S, Hassamal S, Dong F, Neeki M. (2021):** Depression and anxiety prevalence in nursing staff during the COVID-19 pandemic. Nurs Manage. 2021 Jun 1;52 (6):24-32. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8162218/
- **Soltan, E., El-Zoghby, S., & Salama, H. (2020):** Knowledge, Risk Perception, and Preventive Behaviors Related to COVID-19 Pandemic Among Undergraduate Medical Students in Egypt. SN Comprehensive Clinical Medicine, 2(12), 2568–2575. https://doi.org/10.1007/s42399-020-00640-2
- **Spitzer (2006):** Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Archives of Internal Medicine. 2006;166 (10):1092–1097. doi: 10.1001/archinte.166.10.1092. [PubMed] [CrossRef] [Google Scholar]
- **Vallée, A., Blacher, J., Cariou, A., & Sorbets, E. (2020):** Blended learning compared to traditional learning in medical education: systematic review and meta-analysis. Journal of medical Internet research, 22(8), e16504.
- **World Health Organization (2020):** Coronavirus Disease (COVID-19) Outbreak: Rights, roles and responsibilities of health workers, including key considerations for occupational safety and health. Retrieved May 13, 2020 from www.who.int/publicatio ns-detail/coronavirus-disease- (covid-19)-outbreak
- **World Health Organization Novel Coronavirus (2019-nCoV)** Technical Guidance. 2020. Available online: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance (accessed on 19 December 2021)
- **Wu, Z., & McGoogan, J. (2020):** Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72314 cases from the Chinese center for disease control and prevention. JAMA. https://doi.org/10.1001/jama.2020.2648
- **Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., & Wu, G. (2020):** A Novel Coronavirus from Patients with Pneumonia in China, 2019. N Engl J Med, 382, 727-733.