Effect of Resilience Intervention on Nurses' resilience and Psychological Problems during The COVID-19 Pandemic

Souzan Abd Elmenem Abd Elghafar Harfush[1], Amal Awad Abd El-Nabi Moussa[2] , Shereen Mohamed Abo- elyzeed [3] .

[1] Lecturer of Psychiatric and Mental Health Nursing, Faculty of Nursing, Tanta University , [2]Assistant professor of Psychiatric Nursing and Mental Health Department, Faculty of Nursing , Dmanhour university , [3] Assistant professor of Psychiatric and Mental Health Nursing, Faculty of Nursing, Tanta University

Corresponding author: Souzan Abd Elmenem

Email: suzan.ahmed@nursing.tanta.edu.eg ***ORCID:*** 0000-0001-6612-0652

Abstract

Background: Nurses are vital resources for every country. Their mental health and psychological wellbeing are crucial not only for continuous and safe patients care, but also for control of any outbreak. Resilience can be described as the ability to get better after difficult life experiences or overcome change or disasters. So, it is important to help nurses for building their resilience. **Objective:** the study aimed to evaluate the effect of resilience intervention on nurses' psychological problems, and their resilience during time of coronavirus pandemic. **Setting:** the present study was conducted at two settings in Tanta city, Egypt: Psychiatry, Neurology,&, Neurosurgery center that is affiliated to Tanta University, and Al-Minshawy General Hospital that is affiliated to Ministry of Health and Population. **Subjects:** 70 nurses who are caring for patients with corona virus. They were selected by using convenience sampling design. **Tools**: three tools were used to collect the necessary data: Socio-Demographic Questionnaire developed by researchers, Four Dimensional System Questionnaire (4DSQ) was developed ***by Terluin .B (2012),*** and Connor - Davidson Resilience Scale (CD-RISC) was developed by ***Connor &Davidson (2003) .***The participants divided into small groups and attended eight sessions of resilience intervention through zoom cloud meetings**.** **Results**: there was a statistically significant improvement in nurses' resilience & psychological problems after the intervention, Also, a statistical significant negative correlation was found between resilience and all psychological problems. **Conclusion:** resilience intervention is proved to be effective in improving nurses' resilience and psychological health. **Recommendations:** Continuous training intervention that targeting and enhancing resilience are important to be planned and implemented to improve psychological wellbeing among frontline nurses who are caring with patients infected with corona virus.

Keywords: Resilience, Corona virus, and psychological problems

Introduction

The novel corona virus disease (COVID - 19) outbreak emerged in Wuhan in December 2019, and on 30 January was declared a public health emergency of international concern by the world health organization [(1)]. News about COVID-19 pandemic is frightening, with an overwhelming number of new cases and death rate every day. Undoubtedly, this is a stressful time, especially the stressor is new, the absence of warning for preparation and pre-adaptation, no antidotes or vaccinations are currently available [(2)]. This is producing a huge burden on health care workers.

Health care workers are vital resources for every country. They are working on the frontlines of the Corona virus outbreak [(3)]. They are often under daily pressure due to several reasons such as; nurses are putting in risk conditions where they are fighting a lethal virus with inadequate equipment and non-evidence-based treatment (no specific life-saving treatment) and fear of being infected. This stress extends outside of the realm of health care facilities, and includes worrying about infecting their families and contaminating their homes which leads to continued infected vehicle [(4)]. They may be choose to self- isolate or force the guilt of potentially infecting a family members. Social isolation and subjective feeling of solitude are known risk factors of suicide. Moreover, every day there is the significant existential stress associated with witnessing other dying, loss of many patients, colleagues or loved one [(5)].

The possible stress reaction to threatening situations such as dealing with patients have coronavirus may include decreased of concentration, irritability, anxiety, insomnia, fear, reduced productivity, and interpersonal conflicts [(2)].In addition to prolonged exposure to these stressors may have a long term negatives psychological consequences on health care workers and job performance, leading to a poor quality of patients care [(3,6).] Therefore, nurse' health and safety are crucial not only for continuous and safe patient care, but also for control of any outbreaks in the future[(7)].

A recent study in Wham China demonstrated that women nurses are particularly vulnerable to experiencing depression, insomnia, and distress in these work condition [(8)].The ***World socialist website, (2020***) have reported suicide case among nurses working in the intensive care units in Europe that could potentially be related to the COVID-19 emergency [(9)]. It suggested that a strong need to mental health protection of nurses, and provide psychological support. Based on the evidence for risk of psychological

problems among nurses who are working in the frontline against CVID-19, Primary concern is protecting the psychological well- being by fostering nurses' mental resilience to cope with difficult situations and to enable them to continue to perform their duties [5,10]

Resilience is a process of adjusting well in the time of trauma, tragedy, threat, adversity, or even significant sources of stress[11]. It is also described as an individual's ability to cope with various adverse conditions while maintaining a sense of purpose, balance, and positive mental and physical well- being [12]. Many empirical studies supported that resilience is negatively correlated with depression and anxiety, and positively corrected with life satisfaction, subjective well-being, and positive emotions [13-18] .

The concept of resilience in nursing has received much attention and some programs have been developed to teach resilience to the nurse [19, 20]. ***Mealer et al (2017*** indicated that nurses with higher levels of resilience are significantly less likely than those with low levels to experience post-traumatic stress disorder (PTSD), anxiety, depression, and burnout syndrome [21]. The loss of resilience in nurses not only compromises their health but also leads to burnout or leaving intentions, which are major concerns in nursing management[22]. Data from China have shown that social and psychological intervention could be significantly enhance nurses' resilience and well - being during the COVID -19 outbreak [23] .

The important components of personal resilience are involved optimism and adaptive coping (cognitions), emotional competence, adaptive health practices, and social support. ***Optimism*** involves an individual's belief that good things will happen to them in the future [24]. From a resilience perspective, optimism has been linked with psychological well-being in the face of adversity, better physical health, and adaptive coping mechanisms [25]. ***Adaptive coping*** refers to the ability of an individual to manage a situation and a general cognitive ability to actively deal with global adversity [26, 27] . ***Emotional competence***, is the another component of resilience, that means the ability to perceive emotions, utilize, and regulate emotions [28]. Another component of personal resilience was ***adaptive health practices***. It includes physical exercise, rest, relaxation, good nutrition, and smoking abstinence. ***Terte et al (2014)*** explored the strong link between adaptive health practices and physical and mental health [29]. The last component of resilience is ***Social support*** which is very important to develop resilience; it is a key

environmental influence. Social support has also been shown to promote psychological wellness, protect cognitive decline and contribute to physical health [30]. These components of resilience were expected to work together to provide higher levels of resilience among nurses who exposed to higher stressful situations[29].

Significance of the study:

Nurses are under huge pressure at work, due to increased exposure to patients with the corona virus. They have greater risks for psychological problems, such as distress, anxiety, depression, insomnia and other somatic symptoms. A literature review concluded that resilience in nurses is an important factor for promoting their mental health, helping them remain caring, focused on their patients' needs , and provide qualified nursing care.

Aim of the study:

The study aimed to evaluate effect of resilience intervention on nurses' resilience &psychological problems during the COVID-19 pandemic.

Research hypothesis:

The resilience intervention expected to improve nurse' resilience and psychological problems

Operational definition: the psychological problems that investigated in the present study includes: distress, anxiety, depression, and somatization that may be experienced by nurses who were caring for patients infected with corona virus.

Research design: a quasi-experimental design was utilized.

Setting: the present study conducted at two settings; Psychiatry, Neurology & Neurosurgery center that is affiliated to Tanta university, and Al-Minshawy General Hospital that is affiliated to Ministry of Health and Population, Tanta city, Egypt. These two setting are recently be a quarantine hospital to give healthcare services for patients who infected with coronal virus. These settings are working 7 days\a week , 24 hours \day.

Subjects: the participants of this study selected by using conveniences sampling design from nurses who caring for patients with corona virus in the previous settings. The sample size estimated using EPi-Info created by World Health Organization and Center for Disease Control and Prevention, Atlanta, Georgia, USA version 2002 ; 95% confidence limit, 80% power of the study, Expected level of psychological distress 80% before intervention that will be declined to 60% after intervention. Based on these criteria the sample size was N>66. The sample size was increased to 70 nurses to increase validity of the study results

Tools of the study: the present study used the following tools

Tool (1) Socio-demographic questionnaire: it was developed by researchers to elicit information about nurses' age, sex, residence, social status, level of education, their role in health care system, and their years of experience in field of nursing care

Tool (2) : Four Dimensional system Questionnaire (4DSQ):

It is a self-report questionnaire that developed by ***Terluin (2012)*** [31]**.** It consisted of 50 items disturbed over four subscales namely: The distress subscale measure individual basic response to life stressors (16 items), anxiety (12 items) and depression (6 items) subscales measure a specific symptoms of anxiety and depressive disorders and somatization subscale (16 items) measure somatic symptoms associated with distress. The responses are categorized in five points likert scale: no (0) , sometime (1) , regularly (2) , often (3), and constantly (4) . The score of all items are summated and ranged from (**0-200**) .The total score of all items and each subscale is divided according to validated cut- off points in to three parts as follow; Nurses with a score less than 50% denote mild level of psychological problem, 50–75% indicate moderate level of psychological problem , and more than 75 denote severe level of psychological problem .

Tool (3) :Connor - Davidson Resilience Scale (CD-RISC): This scale developed by Connor & Davidson(2003) [32]. It is a 25 items that measure the ability of individual to cope with distress and diversity. All items were rated on five points likert scale are ranging from not true at all (0) to true all the time(4). The total score is summated and high score indicated high resilience. The score of this scale is divided according to validated cut-off points in three parts as follow: low resilience (less than 50%) moderate resilience (50 to 75%), and high resilience (higher than75%).

Method:

An official permission was addressed from the dean of the faculty of nursing Tanta University to the manager of psychiatry, Neurology &Neurosurgery center, and El-Minshaw General hospital to gain cooperation for data collection.

Ethical consideration*:*

- The present study was revised and approved by the ethical committee of Faculty of Nursing, Tanta University .
- Informed consent was obtained from all participant after explaining the purpose of the study, methods of data collection and intervention.

- The participants were assured about the confidentiality of their information, and respecting their rights to withdraw at any time during period of data collection.

Actual study: the actual study consisted of four phases:

Preparation

Tool two and three translated to Arabic languages and tested for content validity by jury composed of five experts in the psychiatric nursing field; and modification was done accordingly. Then tested for reliability by using Cronbach's alpha test, and found that have excellent internal consistently (α= 0.948 and 0.922 respectively) . By using Google drive the tool created as an electronic tool by the researcher.

The researcher visited the study settings that mention previously and invited nurses to participate in the study, an informed consent and their phone numbers were obtained**.** A what's app groups were created by the researcher (from 6 to 10 nurses in each group), after that the study tools' link was sent to what's App groups and the researchers explained how to fill the study tool through click on this link. https://docs.google.com/forms/d/1qnf6XpBWCKxXiut3xmVhoPuRmtqrOPXZmd2J5_JT_k/edit

A pilot study was carried out on 10% of the study sample, they were selected randomly from the list of the nurses' phone numbers by simple random method (picking up their phone numbers from a pool), and these nurses were excluded later from the actual study, the pilot study was conducted to ensure the clarity and applicability of the study tools as well as find out any problems or obstacles during data collection.

Planning:

Based on the results of the study tools the needs of participants were determined and the content of the resilience intervention were prepared by the researchers after reviewing the recent related literature **(33-36)**

The participants were divided into small groups (6-10 for each group),each sub-group attended eight training sessions, three sessions per week with duration 60 to 90 min.

Through zoom cloud meetings the researchers arranged meetings schedules with the participants and send the user ID and password 10 minutes before the meeting time to implement the intervention.

Implementation:

The intervention sessions were conducted as a follow:

First session (introductory session) it includes getting familiar with the groups' members, recognized rules, frameworks of training sessions, Knowledge about stress, anxiety, its' manifestation, and its' impact on mental health, and discussed the stressors that faced nurses who caring patients with corona virus.

Second session: during this session the researchers explained meaning of resilience, characteristics resilience people, and role of resilience in maintain and promote mental health during adversity, followed by discussion within group. The researchers get the participant's feedback about the previous session and this process will be repeated in each session. .

Third session: through this session the researchers presented A-B-C model of resilience in adversity for psychologist Albert Ellis (1913-2007), that explained how negative thoughts effect on emotions and behaviors which leads to reduction in the individual's ability to cope with adversity or life stressors. The researchers discussed within the groups the best methods to overcome negative thoughts that associated with COVID- 19 pandemic, this discussion followed by a training exercise about the common life stressors that already experienced by group members in their life, through discussion, reaction, and interaction between members, they reached to a suitable rational interpretation of those stimulated life stressors didn't seeing stressors as insurmountable problems .

Fourth session focused in improve nurses' self-confidence especially when facing stressful situations or adversity. This was done thorough given opportunities for nurses' self-awareness and discover their strengths or abilities and used it in accomplishment of their life roles, as consequences they acquired a positive view of self. The participants answered questions and applied exercises to discovered more about themselves, and perform homework as training to improve their self-awareness and build self-confidence. Whereby, strengths and vulnerabilities are the basic for understanding one's capabilities that using in dealing with adversity.

In Fifth session, the researcher explored the importance of social support at time of adversity or major life stressor**.** They discussed a characteristics of effective helper and its' impact on his/her mental health, and discussed within the group why some people found difficulties to ask help when needed, followed by discussion, application some exercises to learn them asking help from suitable people to receive adequate support especially at time of emergency.

Sixth session explored for the participants that a sense of purpose and meaning of life act as bedrock for coping, healing, and renewal after adversity**.** The participants encouraged to answered the questions related to criteria of effective life goals, and why some people put goals and can't reached, through discussion and gave examples from life situations each members of the group determined his/her main life goals that motivated them and simulated power to continuing facing life challenges or obstacles.

In the seventh session the nurses learnt problems solving skills and appropriate decision making. These skills involved be open minded, flexible and broad perspective of thinking, optimistic based on realistic positive attitude, learning from past experiences such as having overcome previous adversities or major life stressors, and develop creativity in solving problems and dealing with unpredictable situations. These skills acquired through training exercises, answerable questions that improve self- exploring, and disclosure within the group to discover strength and weakness points in dealing with life problems and stressful situations.

Last session centralized on the best stress management techniques that nurses used to relieve pressure or stress, such as "deep breathing exercises, physical meditation, taking care of self are including diet, sleep exercises, self-smoothing activities, give sense of humor. Through discussion the researcher and group members exchanged information, and recognized the more suitable ways that may be utilized. Moreover, the researchers focused on spirituality and its' impact on mental health especially during the outbreak and adversity. At the end of this session the researchers summarized the main content of the previous training session and receive feedback from participants.

***Evaluation* :** the participants invited to fulfill the study tools two times; immediately post and after three months of resilience intervention by sending the previous study tools link to the participants.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS version 19 (Statistical Package for Social Studies) created by IBM, Illinois, Chicago, USA. For numerical values the range mean and standard deviations were calculated. The differences between mean values before and after intervention were used using student's paired (t). correlation between variables was calculated by Spearman's rank correlation. The level of significant was adopted at $p<0.05$.

Results

Table (1) presents the characteristics of studied nurses according to their socio-demographic data. In relation to age, the total subjects mean age was 29.50±5.65 years with 72.8 % being in the age group ranging from 20 to less than 30 years. As for sex, the majority of studied subjects (81.4%) were females. Concerning residence and marital status, around two thirds (64.3%, 65.7) living in rural areas and were married respectively. As regards the educational status, nearly half of the studied subjects (44.3 %) had Bachelor degree of nursing education. In relation to workplace, more than two thirds of them (68.6 %) worked at Psychiatry, Neurology &Neurosurgery center in Tanta university hospitals with a mean score 7.97±6.03 for years of experience in which 40% had years of experience ranged from five to less than ten years.

Table (2) displays the distribution of studied nurses according to their psychological problems before, immediately post, and after three months of the intervention. Regarding to distress subscale it can be observed that, the majority of studied subjects (87.1%) had severe distress before implementing the intervention and this percent reduced to 60.0% immediately after and **s**lightly increased to be 66.1% after three months. Concerning to depression, those who had severe depression before implementing of intervention constituted the vast majority of the subjects (91.4 %) but this percent decreased to (68.6 %) immediately after the intervention while, increased slightly to (79.0 %) after three months. Speaking of anxiety level, 80.0 % of subjects had severe anxiety before the intervention and reduced to 54.3 % immediately post and raised slightly to 58.1 % after three months. As such somatization subscale, about two thirds of subjects (65.8 %) suffered from severe somatization before the intervention however; this level was decreased to 28.6 % and 27.4 % immediately post and after three months respectively. Regarding the total score of psychological problems, it can be observed that, more than one half of the studied subjects (57.2 %) had severe level of psychological problems before implementing the intervention and this percent decreased to 0.0 % immediately post the intervention and also **9.7 %** after three months.

Table (3) presents the distribution of studied nurses according to their levels of resilience in before, immediately after and after three months of the intervention. The table illustrates that, 42.9 % of the studied subjects had low resilience before implementing the intervention, but immediately after the intervention those

who had high level of resilience amounted to 35.7 % of subjects. However, this level of high resilience slightly decreased to 22.6 % after three months of the intervention

Table (4) illustrates the comparison between psychological problems among the studied nurses in before, immediately post, and after three months of intervention. The table shows that, the mean score of total psychological problems decreased significantly after implementing the intervention. In this respect, the mean score was 47.40±15.90 before conducting training intervention, and decreased to 31.86±11.82 immediately after the intervention (P1= 0.001*). However, it increased to 34.99±12.60 after three months but still has statistical significant difference than level before intervention (P2= 0.001*).In relation to types of psychological problems , the first one of them was distress was 54.40±16.93 before the intervention and reduced to 35.16±14.28 immediately after the intervention with a statistical significant difference (P1= 0.001*) while, the mean score became 39.92±14.31 after three months but also still has statistical significant difference (P2= 0.001*). As for depression, the mean score was 50.12±22.01 and decreased to 31.78±16.32 immediately after the intervention with a statistical significant difference (P1= 0.001*) but the mean score became 37.77±18.32 after three months with statistical significant difference (P2= 0.001*). Concerning to anxiety, it was 45.12±19.35 before and reduced to 30.48±15.36 immediately post with statistically significant difference (P1= 0.001*) nevertheless, the mean score slightly raised to 32.59±17.05 after three months but still has statistical significant difference (P2= 0.001*). The last one was somatization, it was noted that the mean score changed significantly (P= 0.001*) from before, immediately post and after three months (39.95±18.16, 30.02±12.07, and 29.66±11.32 respectively).

Table (5) shows the comparison between studied nurses' resilience mean score before, immediate and after three months of the intervention. It was noted that, the mean score of nurses' resilience was increased significantly immediately after the intervention 73.29±12.36 than the level before intervention 53.09±13.68 (P1= 0.001*)while after three months, the resilience mean score decreased **slightly** to 70.74±12.48 but still highly statistical significant difference than level before intervention.

Table (6) presents the correlation between resilience and psychological problems post intervention. From this table it can be observed that, there are statistical significant negative correlations between resilience and total score of psychological problems as well as all its subscales namely distress, depression, anxiety, and somatization. (r= -0.316, -0.285, -0.275, -0.328, -0.325 respectively).

Table (1): Characteristics of studied nurses according to their socio-demographic data

Socio-demographic data	Number (n=70)	%
Age in years:		
20-	51	72.8
30-	13	18.6
40-	6	8.6
Range	22-47	
Mean ± SD	29.50±5.65	
Sex:		
Males	13	18.6
Females	57	81.4
Residence:		
Rural	45	64.3
Urban	25	35.7
Marital status:		
Single	20	28.6
Married	46	65.7
Divorced	4	5.7
Education:		
Nursing school	3	4.3
Technical institute of nursing	21	30.0
Bachelor	31	44.3
Post graduate	15	21.4
Workplace:		
Al- Menshawy hospital	22	31.4
Psychiatry, Neurology &Neurosurgery center	48	68.6
Years of experience:		
<5	23	32.9
5-	28	40.0
≥10	19	27.1
Range	2-25	
Mean ±SD	7.97±6.03	

Table (2) : Distribution of studied nurses regarding to their psychological problems before, immediate, and after three months of intervention

Psychological problems	Mild		Moderate		Severe	
	No.	%	No.	%	No.	%
Distress						
Before (n=70)	0	0.0	9	12.9	61	87.1
Immediately after (n=70)	4	5.7	24	34.3	42	60.0
After three months (n=62)	4	6.5	17	27.4	41	66.1
Depression						
Before (n=70)	4	5.7	2	2.9	64	91.4
Immediately after (n=70)	11	15.7	11	15.7	48	68.6
After three months (n=62)	9	14.5	4	6.5	49	79.0
Anxiety						
Before (n=70)	3	4.3	11	15.7	56	80.0
Immediately after (n=70)	15	21.4	17	24.3	38	54.3
After three months (n=62)	12	19.4	14	22.6	36	58.1
Somatization						
Before (n=70)	5	7.1	19	27.1	46	65.8
Immediately after (n=70)	6	8.6	44	92.9	20	28.6
After three months (n=62)	5	8.1	40	64.5	17	27.4
Total score of psychological problems						
Before (n=70)	25	35.7	5	7.1	40	57.2
Immediately after (n=70)	63	90.0	0	0.0	7	10.0
After three months (n=62)	56	90.3	0	0.0	6	9.7

Table (3): Distribution of studied nurses regarding to their levels of resilience before immediate and after three months of the intervention

Resilience	Low		Moderate		High	
	No.	%	No	%	No.	%
Before (n=70)	30	42.9	32	45.7	8	11.4
Immediately after (n=70)	4	5.7	41	58.6	25	35.7
After three months (n=62)	4	6.5	44	71.0	14	22.6

Table (4): Comparison between psychological problems among the studied nurses before, immediately post , and after three months of intervention

Psychological problems	Range	Mean ± SD	t	p
distress				
Before (n=70)	20-92	54.40±16.93		
Immediately after (n=70)	6-67	35.16±14.28	21.415	P^1= 0.001*
After three months (n=62)	12-75	39.92±14.31	18.549	P^2= 0.001*
Depression				
Before (n=70)	8-100	50.12±22.01		
Immediately after (n=70)	0-67	31.78±16.32	13.273	P^1= 0.001*
After three months (n=62)	4-79	37.77±18.32	9.071	P^2= 0.001*
Anxiety				
Before (n=70)	12-90	45.12±19.35		
Immediately after (n=70)	8-71	30.48±15.36	11.960	P^1= 0.001*
After three months (n=62)	6-77	32.59±17.05	11.945	P^2= 0.001*
Somatization				
Before (n=70)	9-89	39.95±18.16		
Immediately after (n=70)	9-89	30.02±12.07	10.041	P^1= 0.001*
After three months (n=62)	12-64	29.66±11.32	9.885	P^2= 0.001*
Total score psychological problems				
Before (n=70)	18-79	47.40±15.90		
Immediately after (n=70)	11-58	31.86±11.82	19.352	P^1= 0.001*
After three months (n=62)	13-63	34.99±12.60	17.815	P^2= 0.001*

(t) Student's paired test.

(p^1) Comparison between before and immediate post intervention.

(p^2) Comparison between before and after three months of intervention.

***** Statistically significant at ≥0.05.

Table (5): Comparison between studied nurses' resilience before, immediate and after three months throughout the phases of intervention

Resilience	Range	Mean ±SD	t	p
Before (n=70)	33-85	53.09±13.68		
immediate(n=70)	35-93	73.29±12.36	t=15.613	P^1-= 0.001*
After three months (n=62)	36-94	70.74±12.48	t=14.471	P^2= 0.001*

(t) Student's paired test.

(p^1) Comparison between before and immediate post intervention.

(p^2) Comparison between before and after three months of intervention.

*Statistically significant at ≥0.05.

Table (6) Correlation between resilience and psychological problems post intervention

Psychological problems	Resilience	
	rho	p
Distress	-0.285	0.017*
Depression	-0.275	0.043*
Anxiety	0.328	0.006*
Somatization	-0.325	0.010*
Total score of psychological problems	-0.316	0.012*

*Statistically significant at ≥0.05

Discussion

Supporting the psychological wellbeing and resilience of frontline healthcare workers is imperative to ensure global recovery from the COVID-19 pandemic. Mental health resources and education should be provided to health care providers who are experiencing traumatizing work conditions and unparalleled stress levels. While action to maintain the psychological and emotional health of them needs to start now, these health care providers will need long-term intervention to fully recover from this experience [(5)] .Resilience may reduce the probability of psychological disorders, such as anxiety, depression, and post-traumatic stress disorder (PTSD) . Therefore, the aim of this study was to evaluate effect of resilience intervention on nurses' resilience &psychological problems during the COVID-19 pandemic.

The present study revealed that more than half of the studied nurses have severe level of psychological problems. The depression come the most common problem experienced by majority of the participants, followed distress feeling, and anxiety. Whereby, the somatization symptoms comes the last in its frequency and the nearly half of nurses have lowered level of resilience in facing coronavirus pandemic.. This result may be due to high rate spread of infection of corona virus, a lot of fears and concerns about the possibilities of being infected or infecting their family members, have inadequate information, feelings of loneliness, stigmatization, understaffing, lack of adequate resources either human or financial, and uncertainty about current situation. Along the same line, studies by ***Desclaux et al., (2017)*** and ***Jeong et al., (2016)*** found that health care workers had fears about their own health or fears of being infected and become particularly worried if they experienced any physical symptoms potentially related to the infection [(37,38)].

Recently ***Brooks et al., 2020***, indicated that the possible stress-related reactions among nursing staff in response to the corona virus pandemic may include difficulties in concentration, reduced productivity, irritability, anxiety, somatization, depression ,sleep disorders, and interpersonal problems [(39)]. This consisted with ***Liu et al., (2020)*** [(7)] stated that the frontline healthcare providers who are caring for patients with COVID-19 have a greatest risks of mental health problems, such as anxiety, depression, insomnia, and stress, and agreement with the previous study by ***Bai et al., (2004)*** stated that nursing staff were particularly more liable to exhaustion, detachment from others, anxiety when dealing with

patients, irritability, insomnia, poor concentration, and deteriorating work performance [40].

All the above mentioned along with the seriousness of the situation make the nurses feel the critical need for support and assistance from others during this period of pandemic state. So, this difficult situation calls the present study to implemented resilience intervention in order to decrease nurses' psychological distress, and improved their resilience during time of corona pandemic, and coping effectively with this stressful situation. Completing the picture of nurses' imperative need for training intervention, it appears also through the nurses' reaction during the implementation of the intervention in our study. They were interested, motivated, enjoyed with the intervention content, and make reflective statements about the importance of sessions' topics and their vital needs for it during this specific time of pandemic. Their interest also appears through providing positive feedback and positive feelings toward different sessions of the intervention. Needless to say that all of these may be part of the negative effects of corona virus pandemic on psychological status of nurses reflecting their insistent needs for similar program to help them in better coping and living their life effectively.

The results of the present study also demonstrated a positive impact of the intervention in building and increasing resilience as well as relieving or alleviating total psychological distress with all its four subscales (namely distress, depression, anxiety and somatization) among nurses who participated in our study. This was observed in the results, there was a statistical significant negative correlation between resilience and psychological distress subscales and total score after the intervention. By other words, the research hypothesis was confirmed. Similarly ***Ziaian et al (2012)*** [41] indicated that higher levels of resilience are associated with lesser depressive symptomatology . This result also is consistent with ***Miller and Chandler, 2002*** [42] ***; Nrugham et al., 2010; Wells et al., 2012; Poole et al., 2017;*** and ***Shapero et al., 2019*** [14-17]**.** The findings of the present study is explained by content of resilience intervention that have been provided to nurses encompassed variety of necessary skills that help in effective coping with stressors like; how to overcome negative thoughts, how to improve self-confidence and how to seek social support from others. Other skills that are taught during

intervention are the importance of setting goals in life, how to cope with challenges and difficulties, stress management techniques, and the effect of smiling on individual's mental health.

Furthermore, during intervention of the present study there are many different examples from real life were given to the studied nurses and reflective questions were provided to help nurses to be self-aware about their own reactions, way of thinking and coping strategies they are using at a time of stress. This method of self- introspection help nurses to know their defects and weak points and try to overcome it and learn how to deal with crisis situations with different adaptive manner. In this context, a study by ***Jackson et al., (2007)*** mentioned that resilience construction strategies such as seeking supportive relationships, achieving life balance, enhancing spirituality, positive emotions and putting realistic goals were proved to have protective factors that can help individuals to improve their mental health [(43)].

Another possible explanation for the improvement resilience in general and improving anxiety, depression , distress, and somatization in specific in our participants in the study could be the effect of some cognitive behavioral techniques that applied during sessions of the training program. In this respect, the participants were helped to evaluate their own view about stressful situations and examine factors that lead to their anxiety and depression and learn how to deal with these barriers. This process increases nurses' self-esteem and confidence in facing these situations without anxiety. This is consistent with the cognitive-evaluative model which views the source of anxiety as being in the individuals' cognitive appraisal of their performance and in the expectation of aversive consequences, not in their performance itself. This faulty in appraisal can be the result of unrealistic misperceptions regarding performance, negative self-evaluation or insufficient self-reinforcement [(44)]. On the same line, ***Charney DS (2004)*** stated that cognitive restructuring is one important psychological characteristics of resilience that can be learned [(45)].

It is important to mention that, the researchers in the present study divided participants into small groups to facilitate group discussion and expression of feelings, exchange of experiences, enrich session with valuable and interesting atmosphere, and provide enough time for participants to benefit from learned skills. Moreover, using group strategies and group activities during sessions serve as a

stimulus for interaction between participants for conversation and reducing their anxiety. This may be another factor for explanation of study results. Along the same line, the results of previous studies by ***Rohan et al., (2009)*** and ***Zander et al., (2010)*** [46,47] they suggested that team support can enhance coping skills in times of stress and can help relieving emotional burden in a stressful environment. Furthermore, Findings by ***Edward (2005)*** also suggest that a supportive team improve individual resilience [48].

The results of the present study go in accordance with the results reported by ***Chesak et al (2015)*** **they** analyze the effect of a resilience education program carried **on** nurses' stress, awareness, anxiety and their resilience. They found that, stress and anxiety scores reduced, and awareness resilience scores increased in the experimental group [35]. Similarly a study by ***Jafarizadeh et al (2019)*** [33] titled " Effect of resilience-based intervention on occupational stress among nurses". **They** found that there is a significant difference in the amount of occupational stress and resilience in the two periods before and after the resilience training within the group. Moreover, the study with ***Warelow et al (2007***) under title'' Caring as a resilient practice in mental health nursing'' stated that nurses in the 21st Century should enhance their resilience skills in order to cope with their professional problems and improve their mental health, the resilient behaviors potentially help people to overcome negative experiences and turn it into positive experiences [34]. This comes in agreement with the results of ***Kutluturkan et al 2016*** [49]***, McAllister et al 2009*** [50] and ***Shakernia et al 2009*** [51], and contrasted with, the result of ***Mealer et al (2014)*** who reported that the resilience program that implemented in their study was feasible and acceptable, but their subjects had insufficient power to improve resilience and alleviated their psychological problems [36].

Finally, although there are improvements in resilience level and lowering in psychological stress total and subscales immediately after the intervention, this improvement was decreased after three months from intervention but still there is a significant difference than level before. This result was anticipated because of continuity of pandemic state with all its negative consequences and depletion of staff nurses' resources to deal effectively and maintain their level of psychological equilibrium. This in turn may necessitate the continuity of providing support and assistance as well as conducting a lot of training program directed to nurses who

occupy this stressful career and work under this intolerable situation.

Limitation of the study:

The study sample wasn't selected randomly because the participants should have a commitment to work with researchers for certain periods of time which wasn't possible for all nurses and our resilience intervention implemented through Zoom Meetings and this technology didn't available for some nurses. Therefor the study sample selected by convenience method.

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Conflict of interest: No

Conclusion

Based on the results of the present study, it can be concluded that resilience intervention that implemented on nurses who are caring for patients infected with coronavirus improved their resilience and reducing their levels of psychological problems.

Recommendations: The following recommendations were suggested:

- Continuous training intervention that targeting and enhancing resilience should be planned and implemented to alleviate psychological distress and improve psychological wellbeing among frontline nurses who are caring with patients infected with corona virus.
- Nurses deserve special attention. So, their mental health should be continuously monitored, and professional psychological counseling and crisis interventions should be provided.
- Emotional support should be made in a variety of ways such as; using telemedicine, video chats, or online forums through volunteers' psychologists and psychiatrists to provide mental health services for nurses.
- Emphasis should be placed on developing individualized health care plans for nurses who suffer from psychological breakdown (as anxiety, distress and depression) to assist them to overcome these problems early and return to their wellbeing.
- Resilience training need to be incorporated into nursing education and within health care policies to help create healthier workplace climate, reduce ineffective coping with stressors due to poor mental health and well-being.

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