

Effectiveness of Psycho-Educational Program to Alleviate Depression, Anxiety, Stress, Pessimism and Provide Optimism for COVID-19 Isolation Nurses

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Abstract

Background: Through the coronavirus (COVID-19) pandemic, front-line nurses meet immense mental health challenges. It is actually a global health threat attributed to a negative impact on the mental health and well-being of the people. **Aim:** To study the effectiveness of psycho-educational program to alleviate depression, anxiety, stress, pessimism and provide optimism for COVID-19 isolation nurses. **Design:** A quasi-experimental two-group (randomized control trial) was utilized in this study. **Participants:** A purposive sample of sixty nurses were involved in this study. **Tools:** A constructed interview schedule was utilized to collect data; Depression, Anxiety and Stress Scale-21; and Optimism and Pessimism Scale. The training program consisted of 14 sessions. **Results:** Revealed that there were highly statistically significant relations between depression, anxiety, stress, and pessimism pre/post program in “experimental group”. Also, there were statistically significant relations between pessimism and anxiety among the control group pre/post observations. **Conclusion:** The program had a great positive effect on nurses who were caring for patients infected with coronavirus in reduced “levels of stress, anxiety, depression, pessimism and increased level of optimism”. **Recommendations:** The nursing staff must be prepared to challenge any pandemic in the future to alleviate their levels of depression, anxiety, stress pessimism, and provide optimism and feelings of hope.

Keywords: Psycho-Educational Program, Mental health, COVID-19, Isolation nurses

Introduction

The coronavirus family (COVID-19) has been recently identified that “outcomes in serious and severe respiratory syndrome in humans” (Zhou et al., 2020). Due to the virus outbreak more than 150 countries are currently infected and this virus’s pandemic is a global emergency (Al-Mohaissen, 2017). In Egypt, by the preliminary of April 2020, there were over 800 confirmed cases, above 50 mortalities, and a rapid predisposition towards increase (Abdelhafiz, 2020). The number of confirmed cases increased extremely to reach 6465 cases on the 3rd of May 2020, with about 430 death cases; a jump that can cause anxiety and fear in the population ([https:// www. care. gov. eg/ Egypt_Care/ Index. aspx.](https://www.care.gov.eg/Egypt_Care/Index.aspx), 2020). Low pathogenicity and high transmissibility (Jiang et al., 2020).

The pandemic seriously threatens “mental health” worldwide by increasing rates of

anxiety, depression, post-traumatic stress disorder and negative social behaviors” (Shigemura et al., 2020). During an infectious disease pandemic, many health care workers, containing nursing staff on the front lines caring for patients with the disease suffer from mental health problems. There are serious psychological features to hospitalization for nursing staff members who are directly working with patients who are affected by COVID-19. (Rigby et al., 2019).

In March 2020, “the WHO made the assessment that COVID-19” would be characterized as a “pandemic” (WHO, 2020a). Furthermore, the biological context, and because of the global and long-lasting changes in daily life, it could cause, cope with it is a challenge to psychological resilience. Outbreaks of pandemic diseases and contamination were followed by drastic personal, social and psychosocial influences, which ultimately became more frequent than

the pandemic itself (Li et al., 2020; Ornell et al., 2020).

The greatest source of anxiety for nurses during the COVID-19 pandemic was the fear of becoming infected or infecting other people without knowing it (Mo, 2020).

In every nation, nursing is considered to be the uppermost first line dedicated profession to the prevention of diseases and the improvement of suffering during and after a management of any infection, including the COVID-19 (WHO, 2020b). Social separation measures, such as working in an isolation hospital, which necessary to stop the spread of the virus, increase the threats of isolation, loneliness, and anxiety (Jiang et al., 2020).

Increased pessimism about Covid-19 outcomes is associated with broader pessimism of other health risks but not economic risks. Pessimism over the possibility of hospitalization due to COVID-19 and dying of COVID-19 decreases sharply with age. General pessimism, expressed through beliefs about mortality towards others, correlates with self-pessimism, but even if one considers general pessimism, the age gradient of perceived risks from COVID-19 survives. Pessimism about Covid-19 also increases with education and with the number of medical conditions (Bordalo et al., 2020).

Significance of the Study

In a study done by Arafa (2020) on 1629 Egyptians indicated a high prevalence of depression (67.1%), anxiety (53.5%), stress (48.8%), and inadequate sleeping (23.1%) among the public in Egypt during the pandemic. The study also determined many sociodemographic associations with severe to very severe forms of depression, anxiety, and stress.

Because of the rapid spread of "COVID-19", strong infection, lethality in severe cases, it presents a vast threat to human life and health, and also has a huge influence on the mental health of the general public, causing people differ level of affection problem (Gao, Zheng & Jia, 2020). The risk of infection from "COVID-19." for nursing staff can cause severe psychosocial stress. Unfortunately, many young nursing staff members infected with COVID-19 whose cases seemed to be mild recently deteriorated and died at the early

stage of the disease have further aggregated fear of the virus (Huang et al., 2020). In China, front-line nurses directly caring for patients with COVID-19 experienced insomnia, anxiety, stress, and increased levels of serious mental health symptoms (Lai et al., 2020; Lu et al., 2020; Zhang et al., 2020).

"The World Bank (2017)" emphasized that global preparedness for pandemic outbreaks is vital to global safety and must be included as part of the delivery mechanism for improving health care. As part of a wide-ranging community health response to COVID-19, the risk of this pandemic of mental health problems must be tackled (Xiang et al., 2020). Levels of anxiety will increase, through direct causes, including fears of pollution, stress, sadness, and depression triggered by exposure to the virus, and through impacts from the consequences of the social and economic mayhem that is occurring on individual and societal levels (Blumenstyk, 2020).

To improve nursing staff overall productivity and effectiveness to pandemics, psychiatric nurses want to work on raising their capability to respond to the demand pressure that commonly comes with fierce pandemics with minimal errors or malpractice. This means that nurses' psychological states and stress need to be managed while improving their preparedness to different sorts of pandemic scenarios and enhance their resilience capacity (Buheji & Buhaid, 2020). Optimism has a protective effect on psychological disorders associated with disasters and may contribute to the psychological rehabilitation of post-traumatic stress disorder (Carbone & Echols, 2017). Therefore, in the psychological process for nurses in COVID-19 pandemic, it is critical to strengthen social support, adjust cognitive assessment, guide positive coping styles and foster positive emotions to improve mental health for nurses (Sun et al., 2020).

The covid-19 pandemic has a great psychological impact on adult Egyptians and highly affected social support. Furthermore, pandemics increased the feelings of being horrified, apprehensive, or helpless. However; it increased caring for family members' feelings in many subjects (El-Zoghby, Soltan & Salama, 2020). On March 31, the Egyptian Ministry of Health reported that the General Secretariat for Mental Health has dedicated two

hotlines to provide psychological assistance to people (including healthcare providers) during the COVID-19 pandemic (Ahramonline, 2020; Elkholy et al, 2020). The present study will add to the body of knowledge for nurses on mental changes during COVID19, also, it will add to practice evidence of dealing with those type of patients with COVID-19 pandemic to serve as important evidence to direct the promotion of mental wellbeing among healthcare workers, by screening for symptoms of depression, anxiety, insomnia and stress and by looking at possible risk factors linked to these symptoms. Educate staff nurses about coping strategies, such as behavioral activation, acceptance, and mindfulness, which are effective during crises; fostering resilience and recovery by enhancing feelings of connectedness, increasing tolerance to distress, and encouraging actions that are goal-directed and value-driven. Adding on to peer-support programs that could help the nursing staff in changing their psychological reactions toward the stressful situations that they are facing.

Aim of Study

To study the effectiveness of psycho-educational program to alleviate depression, anxiety, stress, pessimism and provide optimism for COVID-19 isolation nurses.

Objectives

- Assess levels of depression, anxiety, and stress for COVID-19 isolation nurses.
- Assess levels of optimism and pessimism for COVID-19 isolation nurses.
- Design psycho-educational program to alleviate depression, anxiety, stress, pessimism and provide optimism for COVID-19 isolation nurses.
- Implement psycho-educational program to alleviate depression, anxiety, stress, pessimism and provide optimism for COVID-19 isolation nurses.
- Evaluate effectiveness of psycho-educational program to alleviate depression, anxiety, stress, pessimism and provide optimism for COVID-19 isolation nurses.

Research Hypothesis:

- Nurses who will participate in the psycho-educational program will get lower level scores in depression, anxiety, stress, pessimism than those who do not.
- Nurses who will participate in the psycho-educational program will get higher level scores in optimism than those who do not.

Subjects and Methods

Research Design:

A quasi-experimental, two-group (randomized control trial) was used, this trial is a practical, outside comparing guided program (experimental group) established on reducing nurses' levels of depression, anxiety, stress, pessimism and will increase their level of optimism during during COVID-19 pandemic outbreaks, to a wait-list (control group) using 1:1 allocation ratio (Figure "1"). Both groups in the study were given the usual support.

Setting:

The study was conducted by using online approaches like (WhatsApp, Google forms, and Zoom) to communicate with the nursing staff members of the Nursing Syndicate.

The WhatsApp was used to collect the study sample. This is an American freeware and multi-platform messaging service. It allows customers to send messages, make calls, and share media. The WhatsApp user application operates on mobile devices, but is also available on desktop computers as long as the device of the user remains connected to the Internet. (<https://www.whatsapp.com>, 2020).

Google Forms: is a tool that permits collecting data from users through a personalized survey or quiz. The information is then together and automatically associated with a spreadsheet which is occupied with the survey and quiz responses (<https://www.google.com>, 2020).

Zoom: is a web-based audiovisual conference tool with a mobile app and desktop user that permits users to meet online. Zoom users can select to record sessions and cooperate on tasks. Beginning in early 2020, Zoom software usage has increased significantly globally as a result of the introduction of quarantine measures in response to the COVID-19 pandemic (<https://zoom.us.com>., 2020).

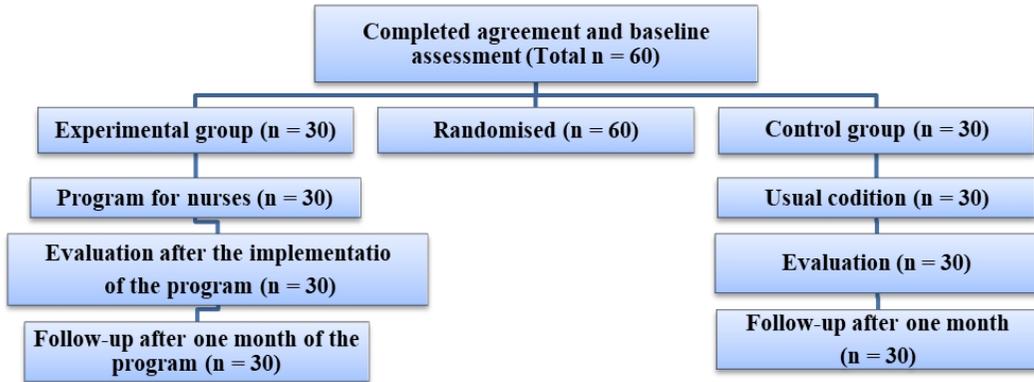


Figure (1): “Workplan profile distributed throughout the study trial”.

Participants:

A purposive sample included 60 nursing staff members, who accepted to take part in this study, distributed randomly into two equal groups that were experimental and control and who met the following inclusion criteria.

Inclusion Criteria: Nurses who were included in direct management for patients with COVID-19, approved to join in the study, both genders, any age, any level of nursing education, who was affiliated to the Nursing Syndicate.

Exclusion Criteria: All nurses who did not involve in direct care for people with COVID-19, who were not available at the study time.

Tools of the Study:

The researchers used three tools to collect relevant data:

Tool I: “Socio-demographic and Personal Data Sheet”: It was developed by the researchers. It included four items concerned with socio-demographic “characteristics of studied nurses” as, gender, age, level of education, and experience years.

Tool II – “The Depression, Anxiety and Stress Scale (DASS-21)”: It was developed by “(Lovibond & Lovibond, 1995)”. It included 21 items was a set of three self-report scales planned to measure the emotional conditions of the presence and severity of symptoms of depression, anxiety and stress among studied

nurses during COVID-19 pandemic. Each of the three (DASS-21) subscales contains 7 items “items for depression, 3, 5, 10, 13, 16, 17, 21; items for anxiety, 2, 4, 7, 9, 15, 19, 20; and items for stress, 1, 6, 8, 11, 12, 14, 18”. The depression subscale assessed self-deprecation, dysphoria, hopelessness, and devaluation of life, lack of interest, involvement, anhedonia and inertia. The anxiety scale assessed skeletal muscle effects, autonomic arousal, situational anxiety, and subjective experience of anxious affect. The stress subscale was sensitive to levels of chronic non-specific arousal. It assessed difficulty relaxing, nervous arousal, and being easily distressed or agitated, irritable or over-reactive and impatient. Where the reply was regarded on a four-point Likert scale for each item, Applied to me “1”, very much “2”, or most of the time “3”; Applied to me to a significant degree or a good amount of the time “2”; Applied to me a particular degree, or some of the time “1”; Did not apply to me at all “0”. Scores for depression, anxiety and stress (DASS-21) were calculated by summing the scores for the relevant items and to calculate the final score as table “1”. The score for depression, anxiety and stress (DASS-21) were calculated by summing the scores for the relevant items as the following table:

Category	“Depression”	“Anxiety”	“Stress”
Normal	0 – 4	0 – 3	0 – 7
Mild	5 – 6	4 – 5	8 – 9
Moderate	7- 10	6 - 7	10 – 12
Severe	11 – 13	8 – 9	13 – 16
Extremely severe	14+	10+	17+

Tool III: “Optimism & Pessimism Scale”:

It was developed by Dember et al. (1989). It included 56-item divided into two subscales, each subscale involved 18-items and 20-items repeated phrases in other formats in order to hide the purpose of the scale. It translated into Arabic format by (El-Desouky, 2001). It was used to measure feelings and actions for optimism and pessimism. Response alternatives for each item was set as follows: A simple instruction was developed for the scale that included examining each of the scale phrases according to four alternatives: I totally agree (3): if the content of the phrase or clause applies to the subject completely. I agree (2): if the content of the term or clause applies to the subject to a greater or greater degree than the average. I do not agree (1): if the content of the phrase or clause applies to the subject to a less or lesser degree than the average. I do not completely agree (0): if the content of the term does not apply to the subject entirely. The phrases or vocabulary that represents the sub-scale of optimism are: 7, 11, 12, 15, 17, 19, 21, 23, 28, 29, 33, 37, 38, 43, 46, 47, 52, 56. The phrases that represent the sub-measure of pessimism are: 2, 4, 5, 8, 10, 14, 20, 24, 26, 31, 34, 36, 39, 42, 44, 49, 51, 54. It was used to calculate the total score for each sub-scale between (low scores 1- high scores 54). A total score of the optimism subscale 0-18 is taken as low, 19- 36 as moderate, and 37- 54 as high. A total score of the pessimism subscale 37- 54 is taken as low, 19- 36 as moderate, and 0-18 as high).

“Validity and Reliability”:

“The depression, anxiety and stress scale (DASS-21)” were examined of its content, validity by five experts in the field. They were “senior staff members” with experience in psychiatric nursing. The recommended modifications were made. It has demonstrated good internal consistency and validity. The values were assessed by ‘Cronbach’s alpha’ coefficient test (0.72, 0.85, and 0.87) for depression, anxiety and stress subscales respectively.

The optimism and pessimism scale was measured for validated into the Arabic culture by (El-Desouky, 2001). It confirmed good internal consistency and validity. Answers from repeated testing are compared (test-retest reliability) the tools stated strongly reliable. The values were assessed by Cronbach’s alpha coefficient test

(0.76 and 0.831) for optimism and pessimism subscales respectively.

Pilot Study:

A pilot study was completed, included six nursing staff members who provided care for patients with COVID-19 & was fighting in the first line. The results of the pilot study shown the relevance, clarity, and applicability of the study tools.

Ethical considerations:

A written informed consent was obtained from the participants. Researchers made complete description of the purpose and nature of the study, also assured confidentiality and anonymity for the participants. All of them was informed that participation in the study was voluntary with no harm or risk consequences and finally had the right to withdraw at any time from the study.

Field of Work:

An official approval to carry out the study was gained from the Syndicate of Nursing to collect the research subjects from nurses under his directorate. The study enrolled 60 nursing staff who was working on first-line fighting COVID-19. They divided into two equal groups (30 nurses for the experimental & 30 nurses for control). Four phases were adopted for the purpose of the study: (A) Assessment phase, (B) Planning phase, (C) Implementing phase, and (D) Evaluation phase. The four stages of data collection took 5 months (from the beginning of April to the end of August of 2020).

1. Assessment Phase: The researchers made an invitation to nursing staff members from the Syndicate of Nursing (WhatsApp group) who met inclusion criteria. The nurses were inquired to participate in the study after establishing a trusting relationship and clarifying the purposes of the study. The procedure sustained until the required 60 nurses was got. The recruited nurses were submitted to a pretest utilizing the tools through Google forms (link for experimental group: ([https:// forms. gle/ jyLbm 49 Ecm 3s SHco9](https://forms.gle/jyLbm49Ecm3sSHco9)) and for control group: ([https:// forms. gle/ sg FR8BrZuxoRAaAt6](https://forms.gle/sgFR8BrZuxoRAaAt6)) of the study to assess the nurses' history and reduce depression, anxiety, stress, pessimism and provide optimism during COVID-19

pandemic. This was applied through an online survey separately by the researchers for each nurse who took 15 - 25 minutes.

2. Planning phase: According to the outcomes attained from the survey, also the researchers prepared a study of the literature and the training instructions. It was applied directly after the pre-test. The program contents: "Handouts were designed to meet nurses' needs and to fit into their interests and levels of understanding". They contained different elements to reduce depression, anxiety, stress, pessimism and provide optimism during the COVID-19 pandemic. Teaching methods: "All nurses in the experimental group had given the same training program content, and consumed the same instruction methods", these were: "Lectures/discussions, demonstration, and re-demonstration. Teaching media": They involved pictures, handouts, videos, and the data-show on the researchers' computer.

3. Implementation phase: The researchers contacted nursing staff members, two days a week for applying for the program, the time suitable for each group. The training program was conducted immediately after assessment and planning phases were completed. The study sample of 60 nurses was split into two similar groups (control & experimental). The program was applied to the experimental group, which was divided into six sub-groups who participated in the program at the same time. "Every session" lasted 30 - 45 minutes, fourteen sessions on the internet at Zoom.

The Content of the Training Sessions:

First session: "In this session", the researchers presented themselves to the nurses, the identification between the researchers and groups that "emphasized approval between the group members" (5 nurses). They were motivated to open discussion in order to identify, integrate the group, clarify the aim, and the timetable allowed for interventions. Researchers interviewed nurses at their locations online, where initial data are collected using pre-test instrument one (Parts 1, 2 and 3). At the end of this session, the researchers determined the other meeting times with the nurses. This session took about 30 minutes.

Second session: The researchers had given the nurses introduction and definition of COVID-19 pandemic, signs, symptoms and complications.

Third session: It included a revision in the previous session for 5 minutes and also comprised the "introduction about the infection control", how to apply infection control, personal hygiene and social distancing between people during a COVID-19 pandemic.

Fourth - Seventh sessions: The researchers trained nurses to deal with stress, anxiety, and depression; and apply their coping strategies. They gave nurses time to demonstrate and re-demonstrate coping strategies of stress, anxiety, and depression. The researchers trained nurses about different coping strategies such as: specialized psychological support that provided differentiated, and confidential, complementary practices such as deep breathing exercise, Yoga, relaxation exercises; meditation and mindfulness.

Eighth session: Researchers alleviated psychological trauma associated with infection by the Coronavirus among nurses. The nurses were stimulated to inquire about any questions or demand clarifications they needed and re-demonstrate of coping strategies of stress.

Ninth session: Researchers trained nurses to spend beneficial mental health time in isolated settings, and express their feelings towards infection with the COVID-19.

Tenth session: It included a revision about the previous session for 10 minutes. Researchers trained nurses on how to be optimistic and broadcast optimism for patients and other health teams.

Eleventh session: Researchers re-demonstrated coping strategies for reducing depression. Researchers trained nurses for reducing pessimism and spreading positive energy.

Twelfth session: Researchers gave revision of the program and provided nurses an opportunity to express the benefits from the program and how they felt about it.

Thirteenth session: Evaluation phase1: In this phase, nurses were encouraged to ask

questions or ask for clarification they needed and re-administer the pre-test as a post-test. "Evaluation of the program was done promptly after the eventual presentation of the program functionality 'a post-test survey'", which was the same as the pre-test to evaluate the impact of the program.

Fourteen session: Evaluation Phase2: One month later, after the post-test, the follow-up-test was carried out using the same tools to assess the degree of retention through comparison of results with "pre-post-follow-up-tests" for the experimental and control groups (the same links in Google forms).

Data Analysis

The data collected, coded by researchers, was transformed, entered into a designed form and analyzed by the Statistical Package for the Social Sciences 'SPSS' version 22 (Hays, 2013). The quantitative data were analyzed according to the mean and standard deviation (SD). Qualitative data were provided as a number and a percentage. It was examined using a chi-square test (χ^2). If a predicted value of a table cell was below 5, it was used the Fisher Exact test. The ANOVA test was used to compare the two or more means between pre, post and follow-up in the experimental and control groups of nurses. P-value < 0.05 was determined to be significant and when the P-value < 0.001 was considered highly significant.

Results

Table 1 showed that, there was no significant statistical difference between the experimental group and control group, this means that there were "congruence between the sample" regarding all socio-demographic data, occupational and personal characteristics.

Table 2 represented that there were statistical significant differences between the nursing staff's scores on depression, which showed an improvement in depression levels, whereas 26.7% severely, 36.7% extremely severe" in before, 20.0% severely, 6.7% extremely severe in after and 16.7% severely, 6.7% extremely severe in follow-up of the program in the experimental group. The findings reveal that there are changes between the nurse's scores on anxiety, which showed an

improvement in anxiety levels, whereas 36.7% severely, 33.3% extremely severe in before, 13.3% severely, 10% extremely severe in after and 16.7% severely, 6.7% extremely severe in follow-up of the program for the experimental group. The results demonstrated that there were differences between the nursing staff's scores on stress, which showed an improvement in stress levels, whereas 46.7% severely, 33.3% extremely severe" in before, 10% severely, 16.7% extremely severe in after and 10% severely, 16.7% extremely severe in follow-up the program among the experimental group. These results indicated that the distribution of optimism levels before the program was low (43.3%) and improved after and follow-up the program (76.7%) high level of optimism. This table also indicated that the distribution of pessimism levels reduced from 26.7% before, to 23.3% after and 16.7% follow-up the program.

Moreover, the distribution in depression, anxiety, stresses (DASS); optimism and pessimism mean scores were relatively constant pre/post program sessions in the control group.

Table 3 showed that there were highly positive statistical significant changes between experimental and control groups in relation to depression, anxiety, stress, the co-occurrence of mental disorders "DASS total", optimism and pessimism pre/post program at ($P < 0.000$). While findings showed that there were no statistical significant differences between pre/post program among the control group.

Table 4 displayed that there were negative high statistical significant correlations between depression, anxiety, stress, pessimism and optimism pre/post program among an experimental group at ($P < 0.000$). Also the findings showed that were negative high statistical significant correlations between pessimism and optimism pre/post program among the control group where ($P < 0.000$).

Table 5 presented that there were high positive statistically significant correlations between depression, anxiety, stress, and pessimism pre/post program in the experimental group at ($P < 0.000$). Also, this table revealed that there were statistical significant relations between pessimism and anxiety among the control group pre/post program at ($P < 0.035$, $P < 0.039$ and $P < 0.016$) respectively.

Table (1): Socio-demographic and Personal Data of the Studied Subjects (n=60)

Items	Experimental group (n=30)		Control group (n=30)		X ²	p value
	N	%	N	%		
Age:					1.914 ^{FE}	0.616
Less than 20	6	20.0	4	13.3		
20 - < 31	6	20.0	10	33.3		
31- ≤ 41	13	43.3	13	43.2		
More than 41	5	16.7	3	10.0		
Mean ± SD	30.00 ± 12.96		29.33 ± 10.79			
Gender:					0.000	1.000
Male	10	33.3	10	33.3		
Female	20	66.7	20	66.7		
Level of education:					0.839 ^{FE}	0.865
Diploma	14	46.7	14	46.7		
Intermediate	10	33.3	8	26.7		
Bachelor in Nursing Sciences	5	16.7	7	23.3		
Master / Doctorate in Nursing Sciences	1	3.3	1	3.3		
Experience (years):					2.050	0.562
Less than 5	6	20.0	7	23.3		
5-<10	5	16.7	7	23.3		
10-15	12	40.0	13	43.2		
More than 15	7	23.3	3	10.0		

^{FE} Expected cell value less than 5, Fisher's Exact test was used.

Table (2): Frequency Distribution of Studied Subjects According to Depression, Anxiety, Stress (DASS); Optimism and Pessimism Pre/Post Program Sessions for Experimental and Control Group (n=60).

Variables	"Experimental group" (n=30)						"Control group" (n=30)					
	Before		After		Follow-up		Before		After		Follow-up	
	N	%	N	%	N	%	N	%	N	%	N	%
Depression												
Normal	1	3.3	2	6.7	3	10.0	0	0.0	0	0.0	0	0.0
Mild	2	6.7	7	23.3	12	40.0	1	3.3	1	3.3	1	3.3
Moderate	8	26.7	13	43.3	8	26.7	7	23.3	9	30.0	12	40.0
Severe	8	26.7	6	20.0	5	16.7	12	40.0	10	33.3	8	26.7
Extremely severe	11	36.7	2	6.7	2	6.7	10	33.3	10	33.3	9	30.0
Anxiety												
Normal	0	0.0	1	3.3	3	10.0	0	0.0	0	0.0	0	0.0
Mild	3	10.0	15	50.0	14	46.7	1	3.3	1	3.3	1	3.3
Moderate	6	20.0	7	23.3	6	20.0	0	0.0	1	3.3	2	6.7
Severe	11	36.7	4	13.3	5	16.7	8	26.7	11	36.7	13	43.3
Extremely severe	10	33.3	3	10.0	2	6.7	21	70.0	17	56.7	14	46.7
Stress												
Normal	0	0.0	4	13.3	5	16.7	0	0.0	0	0.0	0	0.0
Mild	2	6.7	7	23.3	7	23.3	0	0.0	0	0.0	1	3.3
Moderate	4	13.3	11	36.7	10	33.3	4	13.3	5	16.7	7	23.3
Severe	14	46.7	3	10.0	3	10.0	14	46.7	14	46.7	16	53.3
Extremely severe	10	33.3	5	16.7	5	16.7	12	40.0	11	36.7	6	20.0
Variables	"Experimental group" (n=30)						"Control group" (n=30)					
	Before		After		Follow-up		Before		After		Follow-up	
	N	%	N	%	N	%	N	%	N	%	N	%
Optimism												
High	10	33.4	23	76.7	23	76.7	10	33.3	10	33.4	10	33.3
Moderate	7	23.3	7	23.3	7	23.3	9	30.0	16	53.3	18	60.0
Low	13	43.3	0	0.0	0	0.0	11	36.7	4	13.3	2	6.7
Pessimism												
High	8	26.7	7	23.3	5	16.7	7	23.3	7	23.3	7	23.3
Moderate	3	10.0	8	26.7	10	33.3	4	13.4	5	16.7	6	20.0
Low	19	63.3	15	50.0	15	50.0	19	63.3	18	60.0	17	56.7

Table (3): Mean and Standard Deviation of Studied Variables Pre/Post Program among Control and Experimental Groups (n=60)

Variables	Experimental group (n=30)			F P value	Control group (n=30)			F P value
	Before	After	Follow-up		Before	After	Follow-up	
	mean±SD	mean±SD	mean±SD		mean±SD	mean±SD	mean±SD	
Depression	12.07 (3.95)	8.53 (3.61)	8.87 (3.41)	8.513 0.000**	12.33 (3.30)	12.77 (3.05)	11.37 (3.06)	1.564 0.215
Anxiety	15.17 (3.09)	6.13 (3.74)	6.57 (3.61)	12.141 0.000**	11.47 (3.99)	12.03 (3.84)	10.97 (3.88)	0.561 0.573
Stress	11.20 (5.61)	11.40 (3.98)	11.53 (3.95)	10.028 0.000**	15.50 (2.60)	15.87 (2.49)	14.47 (2.71)	2.338 0.103
DASS total	38.43 (11.35)	26.07 (10.66)	26.97 (10.22)	12.331 0.000**	39.30 (8.08)	40.67 (7.76)	36.80 (7.85)	1.849 0.164
Optimism	28.23 (14.66)	40.60 (8.46)	41.70 (7.48)	14.699 0.000**	28.73 (14.19)	30.30 (13.1)	31.17 (12.38)	0.260 0.772
Pessimism	34.07 (14.36)	24.10 (11.41)	23.27 (10.45)	7.289 0.001**	34.87 (12.82)	33.63 (11.81)	32.27 (10.98)	0.359 0.700

F ANOVA test * statistically significant at $p < 0.05$ ** highly statistically significant at $p < 0.01$

Table (4): Relationship between, Depression, Anxiety, Stress, Pessimism and Optimism Pre/Post Program among Control and Experimental Groups (n=60).

variables	Optimism											
	Experimental group						Control group					
	Before		After		Follow-up		Before		After		Follow-up	
	r	p	r	p	r	p	r	P	r	p	r	p
Depression	-0.801	0.000*	-0.713	0.000**	-	0.000**	0.057	0.764	0.062	0.744	0.136	0.474
Anxiety	-0.652	0.000*	-0.609	0.000**	-	0.000**	-0.308	0.098	-0.280	0.134	-0.335	0.070
Stress	-0.697	0.000*	-0.770	0.000**	-	0.000**	0.051	0.791	0.059	0.755	-0.061	0.749
Pessimism	-0.966	0.000*	-0.878	0.000**	-	0.000**	-0.950	0.000**	-0.937	0.000**	-0.934	0.000**

* Statistically significant at $p < 0.05$

** highly statistically significant at $p < 0.01$

Table (5): Relationship between, Depression, Anxiety, Stress and Pessimism Pre/Post Program among Control and Experimental Groups (n=60).

Studied variables	Pessimism											
	Experimental group						Control group					
	Before		After		Follow-up		Before		After		Follow-up	
	r	p	r	p	r	p	r	P	r	p	r	p
Depression	0.783	0.000**	0.802**	0.000**	0.773	0.000**	0.003	0.989	-0.002	0.994	-0.049	0.796
Anxiety	0.667	0.000**	0.623	0.000**	0.615	0.000**	0.387	0.035*	0.379	0.039*	0.437	0.016*
Stress	0.691	0.000**	0.860	0.000**	0.853	0.000**	0.064	0.736	0.041	0.832	0.140	0.459

* Statistically significant at $p < 0.05$

** highly statistically significant at $p < 0.01$

Discussion

The current study designed to study the effectiveness of psycho-educational program to alleviate depression, anxiety, stress, pessimism and provide optimism for COVID-19 isolation nurses. The results of the present study revealed that there was no statistical significant difference between the experimental and

control groups, this is mean that both groups are harmonized "similarity between the sample" concerning all data on socio-demographic and personal characteristics.

The outcomes of the present study represented that, there were more than one-third of the studied nurses had extremely severe depression and more than one-quarter had severe depression. Similarly, the prevalence of

depression severity could be calculated in studies conducted by, Du Toit, (2020); Lu et al. (2020); Tan et al. (2020) who explained with the respective values for mild and moderate/severe depression as about twenty four percent and sixteen percent. In addition, a study by (Hua et al., 2020) indicated that forty to forty five percent of front-line nurses had depression, and eleven percent had moderate to severe depression.

The result of the present study clarified that there was one-third of the studied nurses had extremely severe anxiety and more than one-third had severe anxiety. These findings were supported by Liu et al. (2020) suggested that the incidence of anxiety among health care workers ranged from twenty two to thirty six percent regarding the severity of the anxiety, data were available in studies with a pooled prevalence of eighteen percent for mild anxiety and seven percent for moderate/severe (Du Toit, 2020; Lai et al., 2020; Lu et al., 2020; Qi, Xu & Li, 2020; Tan et al., 2020). Also, the study by Hua et al. (2020) showed that forty to forty five percent of the frontline nurses experienced anxiety, eleven to fourteen percent having moderate to severe anxiety. Similarly researches done by Alwani et al. (2020); Luo et al. (2020); Zhu, Xu and Wang, (2020) indicated that nurses had the greatest anxiety levels and the highest prevalence of anxiety, ranging from fifteen to twenty nine percent. The results of the present study clarified that there were one-third of the studied nurses had extremely severe stress and nearly one-half had severe stress. The result of the present study that adheres to (Roy 2020; Zhang & Ma, 2020) found that in India and China discovered that a sense of panic regarding the pandemic. Similar to more recent Egyptian study conducted by El-Zoghby, Soltan and Salama (2020) which found that over than half of the participants felt horrified and worried due to COVID-19, as well as, Lau (2005) revealed that "stress levels increased during epidemics".

This means that the nurses were more stressed about the daily activity and how to keep themselves protected from any infection, this made nurses more stressed all the time. In this respect, (Dall'Ora et al., 2019; Adams & Walls, 2020) clarified that, whereas at work, pay attention to your requirements for safe

working, drinks, food and regular breaks. Discover ways to step off for short unscheduled breaks when you are feeling under particular stress. Work shorter shifts when this is possible to do and allow enough time for recovery between shifts.

The outcome of the current study demonstrated that the occurrence of anxiety, stress and depression with mean scores equal to eighty three, these results were in the same line with the results of the earlier study done by Hua et al. (2020) which displayed that forty to forty five percent of the frontline nurses had anxiety or depression, with eleven to fourteen percent had moderate to severe anxiety or depression. As well as, Wang et al. (2020); Zhu et al. (2020) stated that, because of this pandemic, high levels of anxiety, stress and depression had been observed in the general population.

In this regard, Holmes (2020) found high-quality data on the mental health impacts of the COVID-19 pandemic across the population and vulnerable groups, such as health professionals. A total of 33,062 participants offer early evidence that a high percentage of healthcare professionals had significant levels of anxiety, depression and stress throughout a COVID-19 pandemic.

Outbreaks like the COVID-19 pandemic cause anxiety. Anxiety is common among healthcare workers who are directly involved in managing patients affected by pandemics. In addition, as a result of their direct interaction with COVID-19 patients, health care workers are more exposed to stressful events such as patient suffering and death, which could further amplify their fears and anxiety (Pappa et al., 2020). It was suggested that COVID-19 stress can trigger mild to severe levels of psychosocial problems, such as depression, and anxiety (Arslan & Yıldırım, 2020; Bao et al., 2020; Bhuiyan et al., 2020; Çiçek et al., 2020; Gunnell et al., 2020; Satici et al., 2020; Wang et al., 2020). On the other hand, Litley (2020) pointed out that stress, anxiety and depression can be regarded as normal emotional responses to a pandemic.

The results indicated that the distribution of optimism levels before the program is less than one-third of the studied nurses had a high

level of optimism and improved pre/post program to two-thirds of nurses had high levels of optimism. Furthermore the study findings showed that the distribution of pessimism levels, as more than one-quarter of the studied sample before the program had high levels of pessimism. It improved pre/post program that reduced to one-fifth and sixth of the sample had high levels of pessimism. This means that the program had the greatest positive effect on reducing pessimism levels in the studied nurses. The findings showed that were high statistical significant negative relations between pessimism and optimism pre/post program among the control group. This result went on the same line with the study carried out by (Arslan et al., 2020) who revealed that, high levels of optimism and lower levels of pessimism can help people to cope with coronavirus stress and foster lower levels of psychological problems.

The results of the recent study showed that there were high statistical significant relations related to depression, anxiety, stress, the occurrence of mental disorders “DASS total”, pessimism and optimism. The results of the present study mean that the program was comprehensive to deal with improved mental health and focused on training nurses to protect themselves from infection to alleviate anxiety, stress and depression, pessimism and provide optimism. This result means that the nursing staff had benefited from the program in reducing their levels of stress, anxiety, depression and pessimism and providing optimism in the isolation period and caring for patients infected with COVID-19. These outcomes were in same line with the study implemented by (Chen et al., 2020) who clarified that, providing intense education and training for nurses the content included the use of personal protective equipment, hand hygiene, ward disinfection, medical waste management, and sterilization of patient-care devices and management of occupational exposure.

As well as, Harris (2020) explained that use relaxation techniques when stress levels are higher, for example, focusing on what is under your control; Acknowledge feelings and thoughts; Return to your body (notice body-press feet into the floor, or press fingertips

together) and engage in what you're doing refocus on the activity at hand. In this regard, meditation and mindfulness during breaks at work or away from work may also help (Cole-King & Dykes, 2020). Therefore, talk to your coworkers who may well relate to what you're experiencing and may be needing support them. Nursing staff huddles or handovers can be useful ways to check in with each other, and shared breaks also present opportunities. Make sure that other nursing members are aware if someone needs special support during a shift (Bridges et al., 2017; Teoh & Kinman, 2020).

The stress response can help nursing staff understand the stress levels of people and how they are coping (Karmakar, 2017). People may be considered “worried”, they may initially appear to be functioning and coping, but may rapidly come down into developing psychological, emotional and physical signs and symptoms (Cole-King & Dykes, 2020).

Protecting the mental wellbeing of healthcare employees caring for people with COVID-19 has been recognized as imperative for the long-term capacity of the health workforce (WHO, 2020b). In particular, the provision of psychological support to front-line nurses is seen as a major public mental health challenge (Kluge, 2020). There is a strong requirement for immediate action to safeguard the mental health and wellbeing of nursing staff (Moazzami et al., 2020). As regards, Huang et al. (2020) who stated that providing psychological counseling to relieve the mental stress of nurses, nurses were protected and preserved from the feeling of any discomfort. Nurses with symptoms of anxiety are encouraged to seek help from psychotherapists, who will evaluate them and help them deal with potential stress and depression.

The findings of this study displayed that there were highly negative statistical significant relations between depression, anxiety, stress, pessimism and optimism pre/post program among the experimental group. The outcomes of the current study presented that there were high statistical significant relations between depression, anxiety, stress, and pessimism during before, after and follow-up the program in the experimental group. The results revealed that, there were statistically significant

relations between anxiety and pessimism among the control group at before, after and follow up observation. The result was consistent with a study conducted by, Britton et al. (2019) who found that, stress was found to associate positively with pessimism and correlate negatively with optimism.

Individual differences in tolerance, adaptation and expectations may affect how an individual reacts to experiences of conflict. Optimism and pessimism are conceptualized as an important construction to deal with uncontrollable life events (Yildirim & Arslan, 2020). Previous studies indicated that “optimism was associated with adaptive outcomes and well-being”, such as life satisfaction, positive affect, self-esteem, and flourishing (Duy & Yildiz, 2017), whereas pessimism is associated with inappropriate outcomes, such as depression and anxiety (Kwok & Gu, 2017).

It has been accepted that all stress mediators are coping style, cognitive appraisal, and social support. Studies have shown that psychological adaptation and social reinforcement play an intermediate role in acute stress psychological recovery (Sun et al., 2020). All coping strategies during the epidemic disaster have been shown to relieve stress and improve mental health (Main, Zhou & Ma, 2011).

Conclusion

The program had “great positive effect” on reducing levels of depression, anxiety, stress, pessimism and increasing the level of optimism among nurses accomplished the educational session, who caring for patients' infected with Coronavirus.

Recommendations

- Psychiatric mental health nursing staff should be prepared to challenge any pandemic in the future to reduce the levels of depression, anxiety, stress, pessimism, and provide optimism and hope for nurses.
- “Successive studies using longitudinal and experimental designs” should be conducted, which may provide additional insights into the “associations” between the variables studied.

Limitations of the study

Owing to noise, working hours, working load, disconnection of the internet and electricity, it took extra time to complete the sessions.

References

- Abdelhafiz, A. (2020). Knowledge, perceptions, and attitude of Egyptians towards the novel coronavirus disease (COVID-19). *Journal of Community Health*. [https:// doi. org/ 10. 1007/ s10900- 020-00827-7](https://doi.org/10.1007/s10900-020-00827-7).
- Adams, J., and Walls, R. (2020). Supporting the health care workforce during the COVID-19 global epidemic. *JAMA*.
- Ahramonline. (2020). Egypt sets up hotlines for psychological support during coronavirusshutdown-Politics-Egypt. <http://english.ahram.org.eg/NewsContent/1/64/366341/Egypt/Politics-/Egypt-sets-up-hotlines-for-psychological-support-d.aspx>.
- Elkholy, H., Tawfik, F., Ibrahim, I., Salah El-din, W., Sabry, M., & Mohammed, S. et al. (2020). Mental health of frontline healthcare workers exposed to COVID-19 in Egypt: A call for action. *International Journal Of Social Psychiatry*, 002076402096019. [https:// doi. org/ 10. 1177/0020764020960192](https://doi.org/10.1177/0020764020960192).
- Al-Mohaissen, M. (2017). Awareness among a Saudi Arabian university community of Middle East respiratory syndrome coronavirus following an outbreak. *East Mediterr Health J.*, 23 (5), 351 - 360. <https://doi.org/10.26719/2017.23.5.351>.
- Alwani, S., Majeed, M., Hirwani, M., Rauf, S., Saad, S., Shah, S., and Hamirani, F. (2020). Evaluation of knowledge, practices, attitude and anxiety of Pakistans nurses towards COVID-19 during the current outbreak in Pakistan. *Med Rxiv.*, Ahead of Print. <https://doi.org/10.1101/2020.06.05.20123703>.
- Arafa, A., Mohamed, A., Saleh, L., and Senosy, S. (2020). Psychological impacts of the COVID-19 pandemic on the public in Egypt. *Community Mental Health Journal*. <https://doi.org/10.1007/s10597-020-00701-9>.
- Arslan, G. and Yildirim, M. (2020). Coronavirus stress, meaningful living, optimism, and

- depressive symptoms: A study of moderated mediation model. Submitted for publication.
- Arslan, G., Yıldırım, M., Tanhan, A., Buluş, M. and Allen, K. (2020). Coronavirus stress, optimism-pessimism, psychological inflexibility, and psychological health: Psychometric properties of the coronavirus stress measure. *International Journal Of Mental Health And Addiction*. [https:// doi. org/ 10.1007/s11469-020-00337-6](https://doi.org/10.1007/s11469-020-00337-6).
- Bao, Y., Sun, Y., Meng, S., Shi, J., and Lu, L. (2020). 2019-nCoV epidemic: address mental health care to empower society. *The Lancet*, 395 (10224), e37 - e38. [https:// doi. org/ 10. 1016/ S0140-6736\(20\)30309-3](https://doi.org/10.1016/S0140-6736(20)30309-3).
- Bhuiyan, A., Sakib, N., Pakpour, A. H., Griffiths, M., and Mamun, M. (2020). COVID-19-related suicides in Bangladesh due to lockdown and economic factors: Case study evidence from media reports. *International Journal of Mental Health Addiction*. <https://doi.org/10.1007/s11469-020-00307-y>.
- Blumenstyk, G. (2020). Why Coronavirus looks like a 'Black Swan' moment for higher Ed. <https://www.chronicle.com/article/Why-Coronavirus-Looks-Like-a/248219>.
- Bordalo, P., Coffman, K., Gennaioli, N. and Shleifer, A. (2020). Older people are less pessimistic about the health risks of Covid-19. <https://doi.org/10.3386/w27494>. <http://www.nber.org/papers/w27494>.
- Bridges, J., May, C., Fuller, A., Griffiths, P., Wigley, W., Gould, L., Barker, H., and Libberton, P. (2017). Optimising impact and sustainability: a qualitative process evaluation of a complex intervention targeted at compassionate care. *BMJ Quality & Safety*, 26, 970 - 977.
- Britton, M., LaLonde, L., Oshio, A., and Taku, K. (2019). Relationships among optimism, pessimism, and posttraumatic growth in the US and Japan: focusing on varying patterns of perceived stressfulness. *Personality and Individual Differences*, 151, 109513.
- Buheji, M., and Buhaid, N. (2020). Nursing human factor during COVID-19 pandemic. *International Journal of Nursing Science*, 10 (1), 12 - 24. [https:// doi. org/ 10. 5923/ j. nursing. 20201001.02](https://doi.org/10.5923/j.nursing.20201001.02).
- Carbone, E., and Echols, E. (2017). Effects of optimism on recovery and mental health after a tornado outbreak. *Psychol Health*, 32, 530 - 548.
- Chen, X, Tian J, Li, G., and Li, G. (2020). Initiation of a new infection control system for the COVID-19 outbreak. *Lancet Infect Dis.*, [Epub ahead of print]. [https:// doi. org/ 10. 1016/ S1473-3099\(20\)30110-9](https://doi.org/10.1016/S1473-3099(20)30110-9).
- Çiçek, I., Tanhan, A., Buluş, M. and Arslan, G. (2020). Psychological inflexibility predicts depression and anxiety during COVID-19: Acceptance and commitment therapy perspective. Submitted for publication.
- Cole-King, A. and Dykes, L. (2020). Wellbeing for health care workers during COVID19, <https://www.lindadykes.org/covid19>. Accessed 08.04.2020.
- Dall'Ora, C., Ball, J., Redfern, O., Recio-Saucedo, A., Maruotti, A., Meredith, P., and Griffiths, P. (2019). Are long nursing shifts on hospital wards associated with sickness absence? A longitudinal retrospective observational study. *Journal of Nursing Management*, 27, 19 - 26.
- Dember, W., Martin, S., Hummer, M., Howe, S., and Melton, R. (1989). The measurement of optimism and pessimism. *Current Psychology: Research & Reviews*, 8 (2), 102-119.
- Du Toit, A. (2020). Outbreak of a novel coronavirus. *Nat Rev Microbiol*, 18 (3), 123. <https://doi.org/10.1038/s41579-020-0332-0>.
- Duy, B., and Yildiz, M. (2017). The mediating role of self-esteem in the relationship between optimism and subjective well-being. *Current Psychology*, 36 (3), 410 - 416. <https://doi.org/10.1007/s12144-017-9698-1>.
- El-Desouky, M. (2001). Optimism and pessimism about some psychological variables among a group of university students from both sexes. *Journal of the College of Education, Ain Shams University*, 25 (2), 341 - 393.
- El-Zoghby, S., Soltan, E., and Salama, H. (2020). Impact of the COVID-19 pandemic on mental health and social support among adult Egyptians. *Journal Of Community Health*, 45 (4), 689 - 695. [https:// doi. org/ 10. 1007/ s10900- 020-00853-5](https://doi.org/10.1007/s10900-020-00853-5).

- Fava, G., McEwen, B., Guidi, J., Gostoli, S., Offidani, E., and Sonino, N. (2019). Clinical characterization of allostatic overload. *Psychoneuroendocrinology*, 108, 94 - 101.
- Gao, J., Zheng, P. and Jia, Y. (2020). Mental health problems and social media exposure during COVID-19 outbreak. [https:// www.ssrn.com/abstract=3541120](https://www.ssrn.com/abstract=3541120).
- Gunnell, D., Appleby, L., Arensman, E., Hawton, K., John, A., Kapur, N., Khan, M., O'Connor, R., and Pirkis, J. (2020). COVID-19 suicide prevention research collaboration. Suicide risk and prevention during the COVID-19 pandemic. *The Lancet Psychiatry*, 7, 468 - 471. [https://doi.org/10.1016/S2215-0366\(20\)30171-1](https://doi.org/10.1016/S2215-0366(20)30171-1).
- Harris, R. (2020). FACE COVID. British Association of Paediatric Surgeons, Retrieved from: <https://www.baps.org.uk/professionals/covid-19-information>. Accessed 08.04.2020.
- Hays, A. (2013). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. New York: Guilford Press.
- Holmes, E. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *Lancet Psychiatry*. [https://doi.org/10.1016/S2215-0366\(20\)30168-1](https://doi.org/10.1016/S2215-0366(20)30168-1).
- Hua, D., Kongb, Y., Lic, W., Hand, Q., Zhange, X., Zhuf, L., Wanf, S., Liuc, Z., Shenc, Q., Yangc, J., GuHef, H., and Zhuc, j. (2020). Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study. *Elsevier; EClinical Medicine*, 24, 1 - 10. <https://doi.org/10.1016/j.eclinm.100424>.
- Huang, L. Lin, G., Tang, L., Yu, L., and Zhou, Z. (2020). Special attention to nurses' protection during the COVID-19 epidemic. *Critical Care*, 24, 120. <https://doi.org/10.1186/s13054-020-2841-7>.
- Jiang, S., Shi, Z., Shu, Y., Song, J., Gao, G., and Tan, W., (2020). A distinct name is needed for the new coronavirus. *Lancet*, 395 (10228), 949. [https://doi.org/10.1016/S0140-6736\(20\)30419-0](https://doi.org/10.1016/S0140-6736(20)30419-0).
- Karmakar, R. (2017). Guidelines for stress management. *Psychology and Behavioral Science*, 3. [https:// www.juniperpublishers.com/pbsij/pdf/PBSIJ.MS.ID.555607](https://www.juniperpublishers.com/pbsij/pdf/PBSIJ.MS.ID.555607).
- Kluge, H. (2020). WHO regional director for Europe-Statement to the Press: Physical and mental health key to resilience during COVID-19 pandemic; WHO: Copenhagen, Denmark.
- Kwok, S., and Gu, M. (2017). The role of emotional competence in the association between optimism and depression among Chinese adolescents. *Child Indicators Research*, 10 (1), 171 - 185.
- Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., and Li, R., (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease. *JAMA Netw.*, 3, e203976.
- Lau, J. (2005). Impacts of SARS on health-seeking behaviors in general population in Hong Kong. *Preventive Medicine*, 41 (2), 454 - 462.
- Li, Z., Ge, J., Yang, M., Feng, J., Qiao, M., and Jiang, R. (2020). Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain Behav Immun.*
- Lipley, N. (2020). Covid-19: Not a 'mental health crisis', healthcare experts warn. <https://www.rcni.com/nursing-standard/newsroom/news/COVID-19-not-a-mental-health-crisis-healthcareexperts-warn-159611>. (Accessed on 17 April 2020).
- Liu, S., Yang, L., Zhang, C., Xiang, Y., Liu, Z., and Hu, S. (2020). Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatry*, 7 (4), e17 - e18.
- Lovibond, S., and Lovibond, P. (1995). Manual for the depression, anxiety & stress scales. (2nd Ed.) Sydney: Psychology Foundation.
- Lu, H. (2020). Drug treatment options for the 2019-new coronavirus (2019-nCoV). *Biosci Trends*, 14 (1), 69 - 71. <https://doi.org/10.5582/bst.2020.01020>.
- Luo, M., Guo, L., Yu, M., and Wang, H. (2020). The psychological and mental impact of

- corona virus disease 2019 (COVID-19) on medical staff and general public: A systematic review and meta-analysis. *Psychiatry Research*, 113190.
- Main, A., Zhou, Q., and Ma, Y. (2011). Relations of SARS-related stressors and coping to Chinese college students' psychological adjustment during the 2003 Beijing SARS epidemic. *J Counsel Psychol*, 58, 410.
- Mo, Y. (2020). Work stress among Chinese nurses to support Wuhan for fighting against the COVID-19 epidemic. *J. Nurs. Manage.* <https://doi.org/10.1111/jonm.13014>.
- Moazzami, B., Razavi-Khorasani, N., Moghadam, A., Farokhi, E., and Rezaeia, N. (2020). COVID-19 and telemedicine: Immediate action required for maintaining healthcare providers well-being. *J. Clin. Virol*, 126, 104345.
- Ornell, F., Schuch, J., Sordi, A., and Kessler, F. (2020). "Pandemic fear" and COVID-19: Mental health burden and strategies. *Braz J Psychiatry*.
- Pappa, S., Ntella, V., Giannakas, T., Giannakoulis, V., Papoutsis, E., and Katsaounou, P. (2020). Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain, Behavior, and Immunity*. <https://doi.org/10.1016/j.bbi.2020.05.026>.
- Qi, J., Xu, J., and Li, B. (2020). The evaluation of sleep disturbances for Chinese frontline medical workers under the outbreak of COVID-19. <https://www.medRxiv.2020.03.06.20031278>.
- Righy, C., Rosa, R., da Silva, R., Kochhann, R., Migliavaca, C., Robinson, C., Teche, S., Teixeira, C., Bozza, F., and Falavigna, M. (2019). Prevalence of post-traumatic stress disorder symptoms in adult critical care survivors: A systematic review and meta-analysis. *Critical Care*, 23 (1), 213. <https://doi.org/10.1186/s13054-019-2489-3>.
- Roy, D. (2020). Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry*. <https://doi.org/10.1016/j.ajp.2020.102083>.
- Satici, B., Saricali, M., Satici, S., and Griffiths, M. (2020). Intolerance of uncertainty and mental wellbeing: serial mediation by rumination and fear of COVID-19. *International Journal of Mental Health Addiction*. <https://doi.org/10.1007/s11469-020-00305-0>.
- Shigemura, J., Ursano, R., Morganstein, J., Kurosawa, M., and Benedek, D. (2020). Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin Neurosci*.
- Sun, N., Wei, L., Shi, S., Jiao, D., Song, R., and Ma, L. (2020). A qualitative study on the psychological experience of caregivers of COVID-19 patients. *American Journal Of Infection Control*, 48 (6), 592 - 598. <https://doi.org/10.1016/j.ajic.2020.03.018>.
- Tan, B., Chew, N., Lee, G., Jing, M., Goh, Y., Yeo, L., Zhang, K., Chin, H., Ahmad, A., and Khan, F. (2020). Psychological impact of the COVID-19 pandemic on health care workers in Singapore. <https://www.annals.org/aim/fullarticle/2764356/psychological-impact-covid-19-pandemic-healthcare-workers-singapore>.
- Teoh, K., and Kinman, G. (2020). Looking after doctors' mental wellbeing during the covid-19 pandemic. *BMJ opinion*. <https://www.blogs.bmj.com>.
- Wang, C., Pan, R., Wan, X. Tan, Y., Xu, L., Ho, C., and Ho, R. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int. J. Environ. Res. Public Health*, 17. <https://doi.org/10.3390/ijerph17051729>.
- World Bank (2017). From panic and neglect to investing in health security: Financing pandemic preparedness at national level. International working group on financing preparedness. <http://www.documents.worldbank.org/curated/en/979591495652724770/pdf/115271-REVISED-FINAL-IWG-Report-3-5-18.pdf>.
- World Health Organization. (2020a). Clinical management of severe acute respiratory infection when COVID-19 is suspected,

- World Health Organisation, Interim guidance V 1.2. 13 March 2020. <https://www.who.int>.
- World Health Organization. (2020). Novel coronavirus (2019-nCoV) situation reports. Geneva: World Health Organization.
- Xiang, Y., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T., and Ng, C. (2020). Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry*, 7 (3), 228 - 229. [https://doi.org/10.1016/S2215-0366\(20\)30046-8](https://doi.org/10.1016/S2215-0366(20)30046-8).
- Yildirim, M., and Arslan, G. (2020). Exploring the associations between resilience, dispositional hope, subjective well-being, and psychological health among adults during early stage of COVID-19. <https://doi.org/10.31234/osf.io/vpu5q>.
- Zhang, Y., and Ma, Z. (2020). Impact of the COVID-19 pandemic on mental health and quality of life among local residents in Liaoning Province, China: A cross-sectional study. *International Journal of Environmental Research and Public Health*, 17 (7), 2381.
- Zhang, W., Wang, K., Yin, L., Zhao, W., Xue, Q., Peng, M., Min, B., Tian, Q., Leng, H., and Du, J. (2020). Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. *Psychother. Psychosom*, 1 - 9.
- Zhou, P., Yang, X., Wang, X., Hu, B., Zhang, L., and Zhang, W. (2020). A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, 579 (7798), 270 - 273. <https://doi.org/10.1038/s41586-020-2012-7>.
- Zhu, Z., Xu, S., and Wang, H. (2020). COVID-19 in Wuhan: Immediate psychological impact on 5062 health workers. <https://doi.org/10.1101/2020.02.20.20025338>.
- <https://www.care.gov.eg/EgyptCare/Index.aspx>. Egyptian statistics on COVID-19. 2020 [cited 2020 3 May].
- <https://forms.gle/jyLbm49Ecm3sSHco9>. Tools link for the experimental group.
- <https://forms.gle/sgFR8BrZuxoRAaAt6>. Tools for control group.
- <https://www.google.com>, 2020.