

The Effect of Eye Movement Desensitization and Reprocessing Technique on COVID-19 Induced Anxiety, Depression, Sleep Quality among Emergency Nurses

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Abstract:Background:COVID-19 is an acutely fatal disease as a consequence of progressive respiratory complications. So, the researchers recommended effective strategies should be established to improve medical front-line medical staff's mental health. This study aimed to examine the effect of eye movement desensitization and reprocessing technique on COVID-19 Induced anxiety, depression, sleep quality among emergency nurses. **Method:** A quasi-experimental research one group pre-test and post-test design were used with baseline data collected from emergency nurses working in emergency departments in Menoufia University Hospital and Shebin El-Kom Teaching Hospital, Shebin El-Kom City, Menoufia governorate, Egypt. Four instruments were utilized; a constructed interview questionnaire, COVID-19 Induced Anxiety Scale, Zung Self-Rating Depression Scale, and Sleep Quality scale. **Result:** the current study's findings proved there was a highly significant improvement ($p<0.0001$) in the mean total scores of anxiety, as well as depression ($P<0.0001$) from pre-application to post-application. Also, there was significantly improvement in nurses' sleep quality post-application than pre-application. **Conclusion:** This study showed the importance of the application of the EMDR technique for medical staff in various health settings for decreasing COVID-19 induced anxiety and depression and improvement of quality of sleep. **Recommendation:** Based on the study's findings, it was recommended that medical staff and the healthcare policies should use the EMDR technique as a non-pharmacological method for decreasing anxiety and depression and improving quality of the sleep.

Keywords: COVID-19, Emergency Nurses, COVID-19 Induced Anxiety, Depression, sleep quality, Eye Movement Desensitization and Reprocessing

INTRODUCTION

In late December 2019, a novel coronavirus pneumonia (COVID-19) outbreak occurred in Wuhan City, China, and quickly spread across China, as well as throughout the world. COVID-19 is an acutely fatal disease as a consequence of progressive respiratory complications [1; 2]. COVID-19 is considered the seventh coronavirus that has been proved to infect humans [3; 4]. Globally, there were 7 255 960 confirmed cases of the disease, with 412 583 confirmed deaths.

COVID-19 incidents in 216 countries across six regions as of June 11, 2020. The United States claims to have the most reported cases and deaths, followed by Brazil, Russia, and the United Kingdom, which together account for 48% of all confirmed cases worldwide [5]. The Egyptian Ministry of Health and Population [6] announced that 1,168 new cases of coronavirus had been discovered in Egypt, bringing the total number of cases to 63,923. In addition, 88 people have died as a result of the infection in the last 24 hours, bringing the death rate to 2,708.

Nurses play a vital role during disease outbreaks, emergencies, and disasters, according to nursing organisations like the International Council of Nurses (ICN). For example, during the COVID-19 pandemic, which put immense strain on the healthcare system, nurses faced a variety of difficulties (e.g., increased patient load, increased patient volume, COVID-19 protocols) that harmed their well-being and productivity. Much worse, infection puts nurses' lives in jeopardy. According to the ICN, healthcare staff made up about 90,000, or 6%, of all COVID-19 confirmed cases worldwide. The epidemic has claimed the lives of 600 nurses so far, with the number predicted to rise [5]. Furthermore, a substantial link has been established between the COVID-19 outbreak and negative mental health issues such as stress or burnout, depression, and anxiety, according to a large body of evidence. [2; 7; 8].

World Health Organization [9] documented that many studies have shown that workers in the health care section are subjected to the maximum level of hazards as they are in close contact with patients. Also, [10] stressed Healthcare workers' exposure to various infectious or airborne infectious agents. Nurses are known to be vulnerable to many job-related risks and are subject to a substantial amount of their jobs' emotional pressures [11]. Maunder et al [12] indicated that medical staff responding to SARS experienced a short-term and long-term effect on their mental health. So, the authors recommended that effective support and training will be helpful. Kang et al [13] reported that medical staff in Wuhan faced big pressure, including overwork, infection, inadequate protection, isolation, negative emotions' patients, exhaustion and they did not contact with their families. All of those caused mental health problems as anxiety, stress, depression, denial, fear, anger, and insomnia. Furthermore, the authors stated that mental health issues impaired medical workers' focus, decision-making capacity, and overall wellness, which could hinder the battle against 2019-nCoV. To overcome COVID-19's psychological effect on medical and nursing staff, mental health workers are taking action by providing psychological services including counseling, brochures, and psychotherapy. Also, to measure fear, anxiety, and depression among 2042 medical personnel and 257 administrative staff in Fujian Provincial Hospital, China, a cross-sectional survey was carried out via online questionnaires. The researchers confirmed that There were substantial variations between the two groups in the severity of fear, anxiety, and depression. Frontline medical personnel working closely with infected patients, including in the respiratory, emergency, infectious disease, and ICU units, reported higher scores on the scale of fear and suffered from anxiety and depression. All of that made them susceptible to psychological disorders. Also, the researchers recommended effective strategies should be established to improve medical front-line medical staff's mental health [14].

PY & Song [15] documented that during the COVID-19 epidemic, patients and health workers require mental health services for many reasons, such as frontline health workers will be fearful of being infected and spreading the virus to their children and families, especially those working in isolation wards and accident and emergency departments. A cross-sectional survey of some health care staff in Chinese hospitals found that a large percentage of workers in health care encountered depression, anxiety, and insomnia, and more than 70 percent reported psychological distress [16]. A study was conducted by [17] illustrated that being a nurse was very stressful,

mostly for those working in the emergency department as [18] confirmed in their study that emergency department (ED) Italian nurses showed a greater risk of work-related stress and evidenced higher scores of felt stress, anxiety and depression, than administrative workers. Also, the authors believed that the need for organizational interventions aimed to improve team development and decision-making policies. Also, the nurse must join safety training programs aimed to assist ED nurses to adopt constructive stress coping strategies. In the same line, studies were conducted by [19] and [20] confirmed that during COVID-19's outbreak in China, Emergency and fever outpatients clinics nurses had a higher risk of exposure to COVID-19. Also, many factors led to anxiety and stress such as fear of family member infection, excessive workload, and the death of medical staff.

Zhan et al [21] conducted a cross-sectional and descriptive study to evaluate factors associated with insomnia among Chinese front-line nurses. The authors confirmed that there were several variables associated with insomnia, such as the prevalence of chronic illness, direct involvement in the rescue of COVID-19 patients, length of a midday nap, frequency of night shifts, degree of COVID-19 anxiety, exhaustion, and perceived stress. Besides, the authors suggested steps to enhance the quality of sleep of nurses should be introduced. A cross-sectional study was performed on medical staff comprising doctors and nurses in China to determine the sleep disruption and psychological profiles of medical and non-medical staff during the COVID-19 outbreak. The study's findings revealed that more than half of the participants reported sleep problems and sleep disorders are very common among frontline health care workers was higher compared to the non-front line and non-medical staff. Also, the participants experienced anxiety and depression. Besides, the authors concluded frontline medical workers are more prone to sleep disorders [22].

Eye Movement Desensitization and Reprocessing (EMDR) intervention is one of the most effective psychological interventions on patients' health status [23]. It is considered a safe technique that does not have any complications for patients and uses regular and quick movements of the patient's eyes. EMDR is a technique that is based on the "Adaptive Information Processing model" [24]; which is usable for all ages and its core includes the change in inefficient experiences and thoughts stored [25]. EMDR aims to deal with incidents that cause negative emotions in patients. The EMDR technique allows patients to recall distressing memories daily when moving their eyes, which is why their thoughts are ordered [26]. Many Iranian researchers used EMDR in their studies. For example, Rahimi et al showed that implementation of this technique for 30 - 45 minutes reduced stress levels among patients on hemodialysis [27]. Also, the findings of Marofi et al.'s study, showed that 45 -60 minutes implementation of this technique reduced the pre-surgery anxiety of patients aged 12 - 18 years, which indicates the effectiveness of such a technique [28]. In addition, Hatefi et al [29] concluded that EMDR, as a non-pharmacological intervention, decreased patient depression and anxiety, this procedure, which is a free or non-complicated intervention for the healthcare system or patient, is recommended to be conducted while delivering patient clinical care. Working in the emergency department is characterized by speed, so an emergency nurse is one of the health workers are exposed to infection. Also, the lack of studies related to the effect of coronavirus epidemics on emergency nurses in Egypt. Moreover, there are no studies that examine the effect of Eye Movement Desensitization and Reprocessing technique on emergency nurses during the COVID-19 period. So, this study aimed to examine the effect of eye movement desensitization and reprocessing technique on COVID-19 Induced anxiety, depression, sleep quality among emergency nurses.

Methods

Research hypothesis:

- 1- Emergency nurses will experience low COVID-19 induced anxiety and depression scores post-application of Eye Movement Desensitization and Reprocessing technique than pre.
- 2- Emergency nurses' sleep quality will improved post-application of Eye Movement Desensitization and Reprocessing technique than pre.

Research Questions:

- 1- **Are there any correlations between** anxiety and depression after application of Eye Movement Desensitization and Reprocessing technique?
- 2- **Are there any correlations between** anxiety and sleep quality after application of Eye Movement Desensitization and Reprocessing technique?

Research design:

Quasi-Experimental one group pre-test and post-test design.

Setting:

Menoufia University Hospital and Shebin El- Kom Teaching Hospital, Shebin El-Kom City, Menoufia Governorate, Egypt.

Selection of the setting technique:

A multistage random selection of two hospitals in Menoufia Governorate was done. Shebin EL-Kom district was selected randomly from a container contains all districts in Menoufia Governorate; then the researcher wrote the names of all hospitals found **in Shebin El-Kom district** in separate papers; then put them in the bowl and selected two paper through sample random selection. The resulting selection is Menoufia University hospital, and Shebin El- Kom Teaching Hospital. The study was conducted at emergency departments at Menoufia University hospital, and Shebin El- Kom Teaching Hospital, Menoufia Governorate, Egypt.

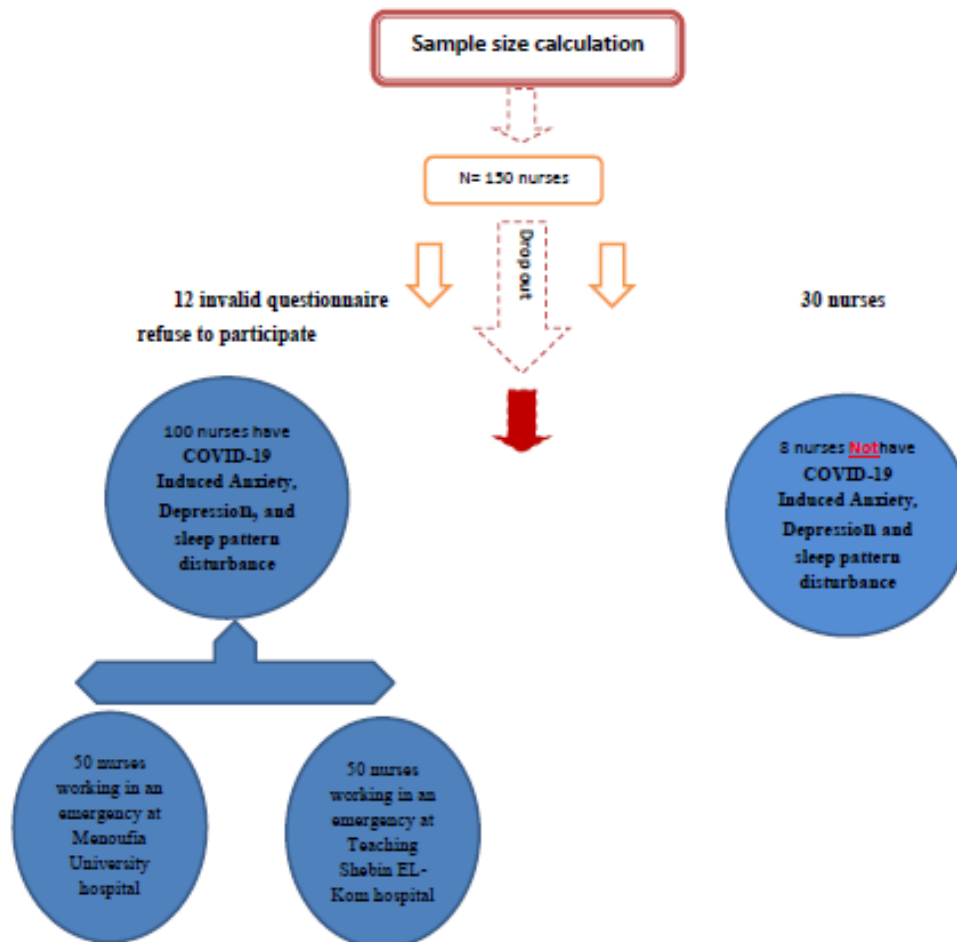
Subjects:

A purposive sample of 100 nurses from the above-mentioned setting (50 nurses working in the emergency department at Menoufia University Hospital and 50 nurses working in the emergency department at Teaching Shebin EL-Kom Hospital) who have COVID-19 Induced Anxiety, Depression and sleep pattern disturbance.

Sampling technique:

Official letters from Menoufia University's Faculty of Nursing were sent to the directors of Menoufia University Hospital, and Shebin EL-Kom Teaching Hospital after an explanation of the study's aim to get their approval to carry out this study. The researcher introduced herself to the nurses and gives a brief description of the purpose of the study in hospitals. The data was collected by sending an online Google Form to the nurses, which included an invitation letter, a description of the study's intent, and a consent form. All nurses received a second notification from the researchers, reminding them to complete the online questionnaire that had been sent (pre-test). The researcher began his research with all nurses in the tow selected settings (150 nurses); and there were 12 invalid questionnaires, 30 nurses refuse to participate in the intervention program so, 108 nurses were remaining. 100 nurses from 108 had COVID-19

Induced Anxiety, Depression, and sleep pattern disturbance, and 8 nurses not have COVID-19 Induced Anxiety, Depression, and sleep pattern disturbance; therefore, the investigator starts the study with 100 nurses (50 nurses working in emergency at Menoufia University hospital and 50 nurses working in emergency at Teaching Shebin EL-Kom hospital).



Tools for Data Collection: Four instruments were utilized to accomplish the current study's aim:

Based on a pre-designed questionnaire, an online Google Form was developed and sent to the nurses' personal accounts via social media, email, or other online systems such as the Zoom application. To prevent disease spread through droplets or contacts, the researchers used a web-based Google Form. The researchers shared the connection to the questionnaire on the social media pages of the nurses in this area to speed up the response process. The nurses were invited to participate in the study through an online Google Form that included an invitation letter, an explanation of the study's purpose, and a consent form. The researchers sent a second notification to all nurses, reminding them to complete the online questionnaire that had been sent.

Tool (1): A constructed interview questionnaire:

This questionnaire was designed by the researchers after the scientific literature review to assess nurses' socio-demographic characteristics such as age, sex, educational level, marital status, number of children, monthly income, and years of experience in an emergency.

Tool (2): COVID-19 Induced Anxiety Scale (CIAS)

The scale was established based on some published literature and the authors' experience. It was developed to evaluate the anxiety induced by the COVID-19 outbreak highlighting the suggested sources of stress and anxious emotions. It consisted of 25 items. It was four points Likert scale (0 – 3) as (0) for Disagree, (1) for Not sure, (2) for somewhat Agree, and (3) for agree with a total score of 0-75. If the nurse had from <14 points of the total score, she/he was considered as "normal, those had from 14-<40 points of the total score, she/he was considered had "mild anxiety, those had from 40-<60 points of the total score, she/he was considered as had "moderate anxiety" and those who had ≥ 60 points were considered had "severe anxiety". It was tested for its validity by a panel of 4 experts (three Professors in Administrative Nursing and one expert has a doctorate in Community health nursing). The tool's reliability was done using test-retest reliability and proved to be reliable; a Cronbach's alpha coefficient was 0.85 which indicates that tool 2 is reliable to detect the study's objectives.

Tool (3): Zung Self-Rating Depression Scale (SDS)

This scale was developed by [30]. The researchers adopted it, translated it into Arabic, and checked it for content validity and reliability. It consists of 20 depression items each was four points Likert scale (1 – 4) as (1) for a little of the time, (2) for some of the time, (3) a good part of the time, and (4) for most of the time). The total score was ranged from 20-80. If the nurse had from <32 points of the total score, she/he was considered as had "minimal/non-depression, those had from 32-<45 points of the total score, she/he was considered had "mild depression, those had from 45-<57 points of the total score, she/he was considered as had "moderate depression", those had from 57-<69 points of the total score, she/he was considered as had "moderate-severe depression", and those who had 69- 80 points were considered had "severe depression. It was tested for its validity by a panel of 4 experts (three Professors in Administrative Nursing and one expert has a doctorate in Community health nursing). The tool's reliability was done using test-retest reliability and proved to be reliable; a Cronbach's alpha coefficient was 0.76, which indicates that tool 3 is reliable to detect the study's objectives.

Tool (4): Sleep Quality scale(SQS)

The SQS was developed by [31]. The researchers adopted it, translated it into Arabic, and checked it for content validity and reliability. It consists of 28 items that assess six aspects of sleep quality: daytime symptoms, sleep restoration, problems initiating and maintaining sleep, difficulty waking, and sleep satisfaction. It was a four-point scale from zero to three. Respondents were asked to indicate how frequently they exhibit certain sleep behaviors (0 = "few," 1 = "sometimes," 2 = "often," and 3 = "almost always"). Total scores range from 0 to 84, with higher scores indicating more acute sleep problems. It was tested for its validity by a panel of four experts (three Professors in Administrative Nursing and one expert has a doctorate in Community health nursing). The tool's reliability was done using test-retest reliability and proved to be reliable; a Cronbach's alpha coefficient was 0.81, which indicates that the tool was reliable to detect the study's objectives.

Pilot Study:

It was conducted on 10 % of the overall sample (10 nurses) to test feasibility, clarity, and the tools' applicability; then the requisite changes were made. Data obtained from the pilot study were included in the current study because the number of all nurses in two emergency departments was small.

Ethical consideration:

The Ethical Committee for Scientific Research Review, Faculty of Nursing, Menoufia University, Egypt approved the proposal. Also, electronic informed consent was obtained from each participant before filling the questionnaire after gaining adequate information regarding the research, voluntary nature of participation & the right to withdraw at any time without penalty, and confidentiality of the study. All the study data were stored in Microsoft Drive under the General Data Protection Regulation (GDPR).

Procedure

-Before the beginning of the research, the researchers took a training course on Eye Movement Desensitization and Reprocessing technique in the center of psychiatry Tanta University. Six hours per day for three days, theoretical and practical training.

- An official letter was issued from the Faculty of Nursing Menoufia University and send to the directors of Menoufia University Hospital, and Shebin EL-Kom Teaching Hospital after an explanation of the study's aim to get their approval to carry out this study. The researchers collected data from 25 August 2020 to 24 December 2020

-The researcher introduced herself to the nurses and a brief description of the purpose of the study.

- The researcher collected data by sending nurses an online Google Form with an invitation message that outlined the study's purpose and a consent form. The researchers sent the second notification to all nurses to remind them to fill the submitted online questionnaire (pre-test).

-The selection of the technique for this study was guided by [32] who illustrated that the EMDR technique is a manualized 8-phases psychotherapy approach based on the “Adaptive Information Processing (AIP) model”. The EMDR technique has eight phases. It consisted of “client history and treatment planning” (Phase 1), “preparation” (Phase 2), “assessment” (Phase 3), “desensitization and reprocessing” (Phase 4), installation (Phase 5), “body scan” (Phase 6), “closure” (Phase 7), and “reevaluation” (Phase 8); so the researcher divided the nurses into four groups every group consisted of 25 nurses, 2 sessions/ week lasted approximately 90 min using Zoom Application. One session of preparation, one session for evaluation, and a total of 8 sessions for EMDR technique and depending on their self-reported progress during the reprocessing and resolution of the traumatic encounter, nurses attended a minimum of three to a maximum of eight sessions.

The Phases of EMDR sessions

Client history and treatment planning (Phase 1)

1.The researcher getting a full history and conducting the appropriate assessment.

2.The researcher and client worked together to identify treatment targets. Memories, present stimuli, and potential aspirations are all possible targets.

Preparation (Phase 2)

1. The researcher explained procedures and practicing eye movement to the nurse.
2. The researcher ensured that the nurse had adequate resources for affect management, leading the nurse through the Safe/Calm Place exercise.

Assessment (Phase 3)

1. By identifying and evaluating each of the memory components: image, cognition, affect, and body sensation, the researcher triggered the memory that was being targeted in the session.

Desensitization and reprocessing (Phase 4)

1. The researcher asked nurses to rate their subjective distress level.
2. The researcher asked the nurse to think about negative attitudes, thoughts, and or somatic sensations associated with the traumatic memory.
3. The nurse was asked to self-reference the memory and visually monitor the quick back and forth movement made in front of her face by the researcher, who used a hand wand or a finger.
4. The finger motions are made in sets of 12–24 strokes per second, going from right to left.

Installation (Phase 5)

1. When repeating the eye movements, the nurse was instructed to blot out the negative picture and think of positive thoughts.
2. The nurse rated his or her subjective level of distress after each collection, noting any changes in image, memory, feeling, or somatic sensations.
3. Sets are repeated until the subjective level of pain diminishes and returns to normal, which normally takes 12–24 sets.
4. While observing the researcher's finger gestures, the nurse was asked to envision a scene or occurrence and equate it with comforting thoughts.

Body scans (Phase 6)

1. Nurse was asked to observe their physical response while thinking of the incident and the positive cognition, and identify any residual somatic distress. Standardized protocols are used to process any disturbances reported by the nurse.

Closure (Phase 7)

1. To bring the session to a close, the researcher used the closure process. Specific instructions and procedures are used to provide containment and maintain safety before the next session if the targeted memory was not completely processed during the session.

Reevaluation (Phase 8)

1. The researcher assessed the nurse's current psychological condition, as well as whether EMDR technique outcomes had been preserved and what memories had surfaced since the previous session, and collaborated with the nurse to determine current session goals.
- Submitted online questionnaire (post-test) was sent through online Google Form to the nurses, which included a COVID-19 Induced Anxiety Scale (CIAS), Zung Self-Rating Depression Scale (SDS), and Sleep Quality scale (SQS).
Statistical analysis

SPSS was used to enter and analyse the data (Statistical Package for Social Science - version 22). Excel was used to create the graphics. The mean (X) and standard deviation (SD) were used to present quantitative results (SD). For comparisons between two ways, the student t-test was used, and for comparisons between more than two means, the ANOVA (F) test was used. Frequency distribution tables, numbers, and percentages were used to present qualitative data. The chi-square (χ^2) test was used to examine it. If any cell in the table had an expected value of less than 5, the Fisher Exact test (if the table had four cells) or the Likelihood Ratio (LR) test were used (if the table was more than 4 cells). For all meaningful measures, a P value of 0.05 was used as the degree of significance.

Results

Sample Characteristics:

Table (1): Revealed that the majority of studied nurses were of younger age group 20- 25 years (32%), females (69%), had nursing diploma (54%), more than fifty percent had to experience > 5 years, married (54%), had two children (42%), had not enough monthly income (65%), and three-quarters of them had support people (75%).

Table (2): Supported **hypothesis 1**, which proposed that application of EMDR technique will decrease COVID-19 induced anxiety and depression scores among participants at post-application corresponding to the pre-application, there was a highly significance improvement ($p < 0.0001$) in the mean total scores of anxiety, also, depression ($P < 0.0001$). High significant lowering of post-application mean anxiety score than in pre-application, were observed in nurses' age, gender, qualification, workplace, experience, monthly income, marital status, the number of kids as well as the presence of support people ($p < 0.0001$ for each). A similar pattern was observed concerning depression. ($P < 0.0001$ for each except among nurses with no support people with $P < 0.01$). Nurses above 40 years had significantly lower anxiety scores than those belonging to younger age groups (18.54 ± 6.68 , $P < 0.0001$). Female nurses were found to have significantly higher anxiety pre-application than the male, but in post-application, both genders had similar lower means (20.71 ± 5.5 vr 20.01 ± 5.6 respectively).

Table (3): Supported **hypothesis 2**, which proposed that nurses' sleep quality will improved post-application of EMDR technique than pre, there was a considerable improvement ($p < 0.02$) in the mean total scores of sleep quality. A significant lowering of post-application mean score of sleep problems that reflect improvements in sleep quality than in pre-application was observed in nurses age older (36 -) age and females more than male ($p < 0.004$ and 0.02) respectively. A high significant lowering of post-application mean score of sleep problems that reflect improvements in sleep quality than in pre-application was noticed in nurses who had the technical institute degree and nurses who were working at Menoufia university and their experience < 1 year and > 5 years (0.0001 , 0.0001 , 0.001) respectively, also related to monthly income, marital status, the number of kids and presence of support people, there was a significant lowering of post-application mean score of sleep problems that reflect improvements in sleep quality than pre-application.

Table (4) and figure (1): Supported **hypothesis 1**, which proposed that application of EMDR technique will decrease COVID-19 induced anxiety and depression scores among nurses at post-

application than pre, Of all anxiety groups, there was a significantly important increase (p0.000). The post-application category “no anxiety” responses were increased from 10% pre-application to 48% for post-application. Both mild and moderate anxiety categories decreased from 88% to 52%, and 2% to zero%.

Table 1: Sociodemographic Characteristics of Studied Emergency Nurses (N=100)

Socio-demographic characteristics	No	%
Age (Years)		
20 – 25 years	32	32
26 - 30	26	26
31 – 35	14	14
36 - 40	15	15
> 40 years	13	13
<i>X ± SD</i>	<i>22.4 ± 2.3 years</i>	
Gender:		
Male	31	31
Female	69	69
Qualification:		
Nursing Diploma	32	32
Tech. Institute Bachelor degree	54	54
Bachelor degree	14	14
Workplace:		
Menoufia University. H.	50	50
Shebin El Kom Teaching H.	50	50
Years of experience:		
< 1 year	9	9
1 - 5 years	39	39
> 5 years	52	52
Monthly income:		
Enough	35	35
Not enough	65	65
Marital status:		
Single	28	54
Married	54	18
Divorced/Widowed	18	
No. Of children:		
No children	34	34
Two children	42	42
≥ 3 children	24	24
Support people:		
Yes	75	75
No	25	25
Total	100	100

Table (5):Supported **hypothesis 1**, which proposed that application of EMDR will decrease COVID-19 induced anxiety and depression scores among nurses at post-application than pre, there was a highly significant improvement ($p<0.000$) in the depression categories. Five percent was the frequency of the "minimal- none depression category" in the pre-application, which increased to 22% post-application. Fifty-eight percent was the frequency of the "mild depression category" in the pre-application, which increased to 61% post-application. Furthermore, there was a post-application decrease in percentages of both moderate and moderately severe depression (35%, and 2% pre-application to 17% and 0% post-application). There was a highly significant statistical difference between pre and post-application depression categories ($P<0.0001$).

Table 2: Effect of Eye Movement Desensitization and Reprocessing Technique on Anxiety and Depression Scores Distributed By Sociodemographic Data of Studied Emergency Nurses (N=100)

Socio-demographic characteristics	No. %	Anxiety score Mean± SD			Depression Mean± SD		
		Pre-Application n	Post-Application n	P value	Pre-Application n	Post-Application n	P value
Age (Years)							
20 – 25 years	32	26.72± 7.20	21.25 ± 5.4	P<0.03	48.19 ± 0.19	37.2 ± 6.61	P<0.0001
26 - 30	26	31.27± 6.38	5	P<0.000	44.77± 10.01	38.0 ± 7.90	P<0.0001
31 – 35	14	34.36± 3.88	20.27 ± 5.3	P<0.000	47.64 ± 0.55	39.5 ± 9.40	P<0.0001
36 - 40	15	31.40± 4.10	7	P<0.000	44.00 ± 8.73	38.6 ± 7.62	P<0.0001
> 40 years	13	29.08± 5.98	21.00 ± 5.7	P<0.000	43.08 ± 8.96	36.6 ± 7.11	P<0.0001
			9	P<0.000			
			18.73 ± 5.3				
			2				
			18.54 ± 6.6				
			8				
Gender:							
Male	31	26.87 ± 7.9	20.71 ± 5.5	P _M <0.00	47.09 ± 9.10	38.38 ± 7.91	P _M <0.001
Female	69	31.38 ± 5.18	20.01 ± 5.6	P _F <0.000	45.4 ± 10.19	37.66 ± 7.48	P _F <0.0001
Qualification:							
Nursing Diploma	32	28.66 ± 6.98	20.40 ± 5.3	P<0.000	47.21± 9.7	37.56 ± 7.11	P<0.0001
Tech. Institute	54	31.44 ± 5.68	19.53 ± 5.5	P<0.000	44.53± 9.6	38.0 ± 7.88	P<0.001
Bachelor degree	14		22.5 ± 6.1	P<0.000	48.35± 10.6	38.21 ± 7.48	P<0.0001

		27.36 ± 7.28		P<0.000 1		7.97	
Work place: Menoufia Unive. H. Shebin ElKom Teaching H.	50 50	30.38 ±6.1 29.58 ±6.8	19.7±5.9 20.76±5.2	P _U <0.000 1 P _{Sh} <0.00 01	45.46 ±6.5 46.40 ±7.17	38.66±6.86 37.12±8.24	P _U <0.001 P _{Sh} <0.000 1
Years of experience < 1 year 1 - 5 years > 5 years	9 39 52	28.00 ± 6.91 28.87 ± 7.91 31.15 ± 4.97	21.33 ±6.0 19.71 ±5.40 20.42 ±5.76	P<0.000 1 P<0.000 1 P<0.000 1	49.00 ±11.15 46.05 ± 9.80 45.30 ± 9.76	39.33 ± 7.81 37.51 ± 6.83 37.92 ± 8.17	P<0.0001 P<0.0001 P<0.0001
Monthly income: Enough Not enough	35 65	30.49 ±5.6 29.03 ±7.7	19.89±5.6 20.85±5.5	P _E <0.001 P _{NE} <0.00 3	46.41±10.0 3 45.02±9.5	38.60 ±7.54 36.57 ±7.59	P _E <0.001 P _{NE} <0.001
Marital status: Single Married Divorced/Widow ed	28 54 18	30.64 ± 6.95 30.52 ± 4.78 27.33 ± 9.41	19.57±5.5 20.16±5.4 21.44±6.4	P<0.000 1 P<0.000 1 P<0.000 1	45.25 ± 6.72 45.44±9.90 49.5±8.55	35.82 ±6.44 38.29 ± 8.18 39.88 ± 6.96	P<0.0001 P<0.0001 P<0.0001
No. Of children: No children Two children ≥ 3 children	34 42 24	30.59± 6.33 28.10± 7.30 32.42±3.97	19.82± 5.28 20.90± 5.87 19.63± 5.73	P<0.000 1 P<0.000 1 P<0.000 1	45.35±10.4 8 46.52± 9.66 45.71± 9.62	37.11±7.41 38.40± 7.04 38.08± 8.88	P<0.0001 P<0.0001 P<0.0001
Support people: Yes No	75 25	28.61±6.7 34.08±3.4	20.48±5.5 19.48±5.8	P<0.000 1 P<0.000 1	45.32 ±10.04 48.32 ±5.2	36.78 ±7.28 41.20 ±7.63	P<0.001 P<0.01
Total	100	29.98 ±6.4	20.23±5.6	p<0.0001	45.93±9.85	37.89 ±7.58	p<0.0001

Table (6) Based on the correlation between anxiety and depression, there was a positive significant correlation between total post-application anxiety score and total post-application depression score ($r = 0.341$, $p < 0.001$). Also, Based on the correlation between anxiety and sleep quality, Anxiety and sleeping efficiency had a negative strong meaningful correlation ($r = -0.323$, $P < 0.001$). Depression and sleeping quality had a similar trend ($r = -0.788$, $p < 0.0001$).

Table 3: Effect of Eye Movement Desensitization and Reprocessing Technique on Sleep Quality Scores Distributed By Sociodemographic Data of Studied Emergency Nurses (N=100)

Socio-demographic characteristics	No. %	Sleep quality score Mean± SD		
		Pre-Application	Post-Application	P-value
Age (Years)				
20 – 25 years	32	34.69± 13.29	33.63 ± 15.68	P=0.09
26 - 30	26	30.58± 8.87	29.42 ± 11.85	P=0.10
31 – 35	14	36.86± 14.08	33.00 ± 14.19	P<0.04
36 - 40	15	41.87± 11.69	25.93 ± 12.05	P<0.0001
> 40 years	13	31.77 ± 14.98	25.38 ± 11.81	P<0.0001
Gender:				
Male	31	34.35 ± 13.24	29.64±14.44	P _M <0.02
Female	69	34.73 ± 12.57	30.47± 13.42	P _F <0.004
Qualification:				
Nursing Diploma	32	33.16 ± 13.86	31.16±14.35	P=0.07
Tech. Institute	54	34.74 ± 11.33	28.00±12.64	P<0.0001
Bachelor degree	14	37.50 ± 15.35	36.64 ±14.69	P=0.11
Workplace:				
Menoufia University H.	50	35.34 ±12.76	28.70 ±13.40	P _U <0.0001
Shebin El Kom Teaching H	50	33.90 ±12.75	31.74 ± 13.89	P _{Sh} =0.06
Years of experience				
< 1 year	9	43.78 ± 14.11	35.22± 18.09	P<0.0001
1 - 5 years	39	31.05 ± 10.87	31.08± 13.50	P=0.94
> 5 years	52	35.71 ± 13.00	28.71 ± 13.00	P<0.001
Monthly income:				
Enough	35	35.80±14.48	28.67±12.16	P _E <0.0001
Not enough	65	32.42 ±8.28	31.06±14.45	P _{NE} =0.11
Marital status:				
Single	28	33.46 ± 11.16	28.39 ± 13.99	P<0.03
Married	54	35.02 ± 12.07	29.69 ± 13.01	P<0.001
Divorced/Widowed	18	35.22 ± 12.07	34.67 ±14.97	P=0.12

		16.95		
N0. Of children:				
No children	34	35.76± 13.33	29.88± 14.47	P<0.02
Two children	42	32.57± 12.62	31.10 ± 13.27	P=0.15
≥ 3 children	24	36.58± 11.99	29.17±13.72	P<0.0001
Support people:				
Yes	75	31.58±10.04	33.0 ±14.47	P=0.06
No	25	43.72±15.50	29.23±13.37	P<0.0001
Total	100	34.62 ± 12.72	30.22±13.67	p<0.02

Table 4: Frequency of Anxiety Groups Pre and Post-Application among Studied Emergency Nurses (N=100)

Anxiety groups	Groups of intervention		P-value
	Pre- Application (No. = %)	Post- Application (No. = %)	
Normal (no anxiety(<20))	10	48	LR=39.2, P<0.0001
Mild anxiety(20 - <40)	88	52	
Moderate anxiety(40-<60)	2	0	
Total	100	100	

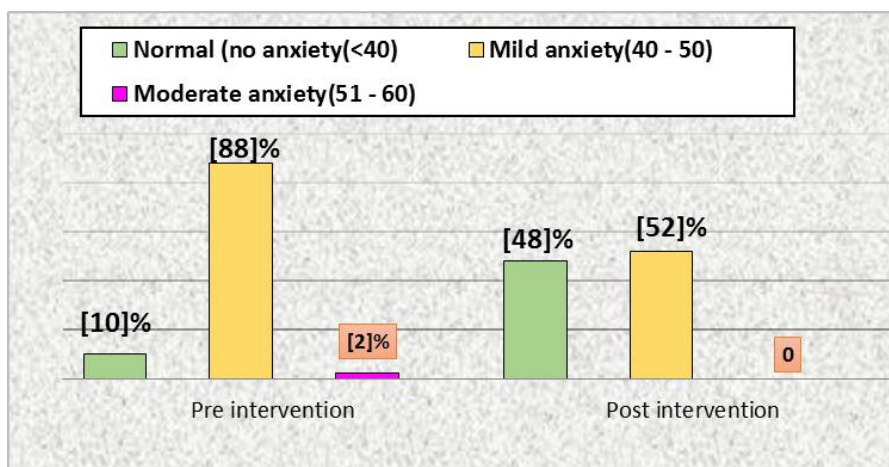


Figure 1: Frequency of Anxiety Categories Pre and Post-Application among Studied Emergency Nurses

Table 5: Frequency of Depression Categories Pre and Post-Application among Studied Emergency Nurses (N=100)

Depression categories	Groups of Application		P-value
	Pre- Application (No = %)	Post-Application (No. = %)	
Minimum/ non depression (<32)	5	22	

Mild depression (32 - <45)	58	61	X ² = 34.7, P<0.0001
Moderate depression (45 - <57)	35	17	
Moderate Severe depression (57 - 68)	2	0	
Total	100	100	

Table 6: Correlation coefficient between post-Application anxiety and depression and sleep quality among studied nurses (N=100)

Items	Total Anxiety		Total Depression		Total Sleeping quality	
	r	P	r	P	r	P
Total Anxiety	1	--				
Total Depression	0.162	0.10	1	---		
Total Sleeping quality	0.323	0.000 *	0.237	0.01*	1	---

Discussion

The findings revealed that the application of the Eye Movement Desensitization and Reprocessing technique had an important role in decreasing COVID-19 anxiety, depression and improving sleep quality among emergency nurses. The current study's first hypothesis suggested that the application of the Eye Movement Desensitization and Reprocessing technique will decrease COVID-19 induced anxiety and depression scores among emergency nurses at post-application than pre-application. Support for this hypothesis was found given that there was a highly significant improvement in the mean total scores of anxiety and depression where ($P < 0.0001$). High a significant lowering of post-application mean scores of anxiety and depression than pre-application (Table 2). This could be attributable to the critical role of the application of the EMDR technique in decreasing scores of COVID-19 induced anxiety and depression among emergency nurses. The findings of this study were in the same line with Hatefi et al [29] who reported that the mean scores of depression and anxiety were reduced after intervention than before among patients with spinal cord injuries. Also, the researchers concluded that as a non-pharmacological intervention, EMDR has been shown to alleviate depression and anxiety in patients, suggesting that this approach be used by patients or the healthcare system when delivering clinical care to patients. In the same line with Stanbury et al's study findings [33]; the researchers revealed a significant reduction in symptoms of posttraumatic stress disorder (PTSD), depression, anxiety, and stress among PTSD patients after EMDR therapy and extended exposure therapy, which lasted for 3 months. Also, [34]; their findings support the effect of EMDR intervention on improvement in anxiety after intervention than pre-intervention. Also, a reduction of the indices of depression after intervention than pre-intervention indicating the effectiveness of the intervention.

Additionally, support for the current study's first hypothesis was found given that there was a highly significant improvement in all anxiety groups than pre-application where ($P < 0.000$) (Table 4 and fig. 1). It can be due to the effect of the application of the EMDR technique in decreasing COVID-19 induced anxiety scores among emergency nurses. The present study's

finding was supported by Sharif et al (2020) who indicated emergency medical staff had a significant decrease in death anxiety score post desensitization technique with eye movements and reprocessing than pre. Also, Saberinia et al [35] concluded that EMDR intervention significantly reduces the risk of death anxiety in the test group than the control group and recommended the use of this method among emergency medical technicians. Also, the current study's result was consistent with [36]; they indicated that there was a highly statistically significant difference found in the total mean anxiety score among the patients with depression pre and post-application of EMDR ($P < 0.05$). Moreover, the current study's finding was supported by Salari et al [37] who conducted a systematic review and meta-regression to assess the prevalence of stress, anxiety, and depression among COVID-19 patients' front-line healthcare staff; the researchers concluded that the results of the study revealed a high prevalence of stress, anxiety, and depression among front-line healthcare staff caring for COVID-19 patients. Therefore, health policymakers should take steps to monitor and avoid mental illnesses among hospital employees. For those reasons, the current study considered one of those measures. In the last, support for the current study's first hypothesis was found given that there was a highly significant improvement and decreasing in the depression categories post-intervention than pre-intervention where ($P < 0.000$) (Table 5). That may be as a result of the effect of the application of the EMDR technique in decreasing depression scores among emergency nurses. This result was in line with [38]; they illustrated that When compared to Cognitive Behavioral Therapy, EMDR had a greater reduction in mean depressive values (CBT). In addition, there was a substantial change in the mean distress score before and after intervention in both the CBT and EMDR groups ($P < 0.001$). As a result, the researchers concluded that while both EMDR and CBT approaches mitigate depression in myocardial infarction patients, EMDR is more successful. In the same line, [39], their study findings proved that patients with depression benefit from adjunctive EMDR therapy in the treatment of acute depression. It was noticed as there were significantly improved Beck Depression Inventory-II scores in the study group (EMDR+ Treatment As Usual (TAU)) than in the control group (TAU only). Also, the current study's finding was supported by the result of a review study was conducted by Shapiro [40], who found that EMDR had positive effects in the treatment of emotional trauma and other traumatic life experiences in 24 clinical trials.

The current study's second hypothesis suggested that emergency nurses' sleep quality will improved post-application of the EMDR technique than before. Support for this hypothesis was found given that the current study's finding illustrated there was a significant improvement in the mean total scores of sleep quality where ($P < 0.02$). Also, a highly significant lowering of the post-application score of sleep problems reflects improvements in sleep quality than before (Table 3). This could be attributable to the significant role of the application of the EMDR technique on decreasing sleep problems that reflect in improving sleep quality. The present study's result was supported by the study's findings indicated there were a highly statistically significant difference pre and post-application of EMDR ($P < 0.05$) [36]. In the same line with [41] who reported that application of EMDR is the cause of reduction of anxiety, depression, fatigue, the event's influence, and an improvement of quality of life and sleep quality. Also, the present study's result was in the line with the survey was conducted by Zhang et al [42] to assess the relationship between Medical workers involved in the 2019 Novel Coronavirus disease epidemic are affected by insomnia, as well as social and psychological causes. The researchers concluded that, during the COVID-19 outbreak, more than a third of the medical workers

experienced insomnia symptoms. So, they emphasized the importance of medical personnel treatments for insomnia. In a similar way, Xiaazheng et al [43] investigated the sleep efficiency of 150 first-line medical workers who were responding to COVID-19. The researchers concluded that their study's results revealed a high prevalence of objective insomnia in front-line medical staff against COVID-19. Also, they recommended that relaxation techniques as a method for improving sleep quality. For those reasons, it was noticed the importance of the current study and application of EMDR technique on decreasing sleep problems and improving quality of the sleep among emergency nurses.

The findings based on research question number one demonstrated that there was a positive significant correlation between total post-application anxiety score and total post-application depression score ($r= 0.341$, $P< 0.001$). The significant positive correlation indicated that, when anxiety increased among emergency nurses, depression will increase (Table 6). The same findings had been reported by [36] who investigated the EMDR technique on psychological status and quality of the sleep among depressed patients; the researchers indicated there was a statically significant positive correlation between anxiety and depression pre and post-intervention. Also, the current study's findings were supported by Sanne et al [44] who revealed a high correlation between anxiety and depressive symptoms.

The findings based on the research question, number two demonstrated that emergency nurses' anxiety and depression had a highly significant correlation with sleep quality and the relationship was negative. The highly significant negative correlation indicated that the higher level of emergency nurses' anxiety and depression, the lower level of sleep quality (Table 6). The current study's result in the same line with [45] who examined the relationship between depression, anxiety, sleep self-efficacy, and college students' sleep quality. The researchers indicated that higher subjective quality of sleep was linked to higher efficacy of sleeping scores and lower levels of depression and anxiety. Also, the current study's findings were supported by [46] who conducted a study during the COVID-19 pandemic to investigate the relationship between sleep quality, depression, anxiety, and stress levels, as well as the prevalence of temporomandibular disorders in a sample of Turkish dental students. The researchers indicated that higher levels of anxiety, stress, and depression caused an increased Pittsburgh sleep quality index that reflected decreased sleep quality. Moreover, the current study's finding was consistent with the study's finding was carried out by Hu et al [47] to investigate the connection between symptoms of depression and poor sleep quality among the elderly in Hunan Province, China's nursing homes. The researchers concluded that poor sleep quality was common, and it was linked to increased depression symptoms.

Conclusion:

According to this study's results, indicating there was decreasing in COVID-19 induced anxiety and depression and an improvement in quality of sleep among emergency nurses. So, it can be concluded the importance of application of EMDR technique for medical staff in various health settings.

Recommendation:

Based on the study's findings, it was recommended that medical staff and the healthcare policies should use the EMDR technique as a non-pharmacological method for decreasing anxiety and depression and improving quality of the sleep.

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