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A Program to Reduce PTSD - Literature review of the COVID-19 Studies

Eman M.E. Ahmed (PhD.)
Associate Professor Casework Department
Higher Institute of Social Work-Alexandria

Abstract:

The goal of this study is to design a program in order to mitigate the symptoms of PTSD. In order to pursue evaluating the most recent research of 2020 that have tackled the symptoms of PTSD during the outbreak of COVID-19, this research was compiled in the form of literature review. 45 studies, of PubMed and NCBI databases were evaluated, 4 of those studies targeted the COVID-19 patients and survivors, 22 discussed the symptoms of PTSD among the public and 19 studies examined the symptoms of PTSD among HCWs. There are several indicators of the increase of PTSD symptoms related to anxiety, depression and sleep disorders among other symptoms. The program was designed to limit the PTSD symptoms in order to take the precautionary measures during any potential future pandemics.

Keywords: Corona virus, PTSD, Literature review.

Introduction:

(Covid-19) is a new disease, which caused by corona virus which affects the respiratory system, which in turn causes the ongoing epidemic with flu-like symptoms, and this virus was first identified and diagnosed in December 2019 in Wuhan, Hubei Province, China, and then kept its name as Covid-19 (Sajed & Amgain, 2020, p. 1-3).

The Corona crisis might has effects on everyone, but the degree of its impact varies in severity on societies, populations, organizations and individuals (Worldometer, 2020)**.** The first incoming data from China and Europe indicate that symptoms of anxiety and depression and perceptions of stress rise significantly as a consequence of the pandemic. So, the Corona pandemic is also a mental health crisis. Veer et al. (2020) also states in reference to the current Corona pandemic, that it does not only threat physical health. The DSM-5 American Psychiatric Association [APA] (2013) indicates that "experiencing repeated or extreme exposure to aversive details of the traumatic event(s)" can be considered as a potentially traumatic event. It is more than common for a person to feel disorder during and after a traumatic situation. However, the majority of people recover from the initial symptoms naturally. Those who will still have problems may be diagnosed with PTSD. Some people with PTSD might not have symptoms for weeks or months. People with PTSD may feel anxious, depressed or afraid, even when they are not in danger.

An online survey of more than 10,000 people was conducted to find out about the mental consequences of the government's current strict lockdown due to the COVID-19 crisis in Switzerland to estimate how self-stress levels and depressive symptoms are influenced by the

lockdown, 50% of respondents reported an increase in stress levels. 57% of participants reported a significant increase in depressive symptoms (de Quervain et al., 2020). The Coronavirus is also placing tremendous pressure on healthcare systems in particular. Massive efforts are being made to prevent further outbreaks, treat the sick, and train and protect health professionals (Bal, de Graaff, van de Bovenkamp & Wallenburg, 2020, p. 671-673). Cai et al. (2020a) study confirmed that health care workers suffering from the COVID-19 epidemic, who had no experience in treating public health emergencies, showed worse mental health performance, and lacked flexibility and social support (p. 102-111). Risk factors make a person more likely to develop PTSD. Other factors, such as resilience and support, can help reduce the risk of the disorder. Therefore, the aim of this research is to review the studies investigating PTSD symptoms among health care workers, recovering patients, and the public who have encountered corona virus outbreaks around the world, with the objective of developing a program to reduce this disorder. The psychological burden is on health care workers, patients, as well as, the public. Research questions: 1- What are the symptoms of PTSD among health care workers, recovering patients, and the public who have faced the outbreak of the Corona virus, and what are the most important conclusions of the analysis of the latest research on this topic.2- What is the program to reduce symptoms of PTSD?

Study Concepts: 1- Corona virus: there are a large scope of viruses that resemble the crown. There are different types of corona viruses, and people all over the world are usually infected with human coronaviruses 229E, NL63, OC43 and HKU1 which lead to severe respiratory diseases (Effiong et al., 2020). The known animals which host for Coronavirus are bats. They are also capable of transmitting infection from one person to another. The reported incubation period ranges from 1-14 days but exceptionally in a few cases of patients it was seen even after 21 days (Effiong et al., 2020).

2- Post-Traumatic Stress Disorder (PTSD) concept: PTSD is a trauma-related disorder with traits of fear and negative thinking about trauma and the future. If left untreated, it leads to persistent disruption of life due to avoidance, impaired professional and social functioning, and other symptoms (Ellis & Zaretsky, 2018).

PTSD summarizes the clinical features that include PTSD which are event-related symptoms (invasive recall of aspects of the event, avoidance of reminders, and excessive alertness) along with dysarthria, hypertonia, or anhedonia. PTSD is a pervasive consequence of both

worldly and individually traumatic events (Qi, Gevonden & Shalev, 2016). In this study, PTSD is defined as a group of symptoms associated with exposure to the spreading Corona virus crisis, which in turn affected the infected, recovered, the public or health care workers, such as anxiety, depression, stress and poor sleep, which affects their future quality of life.

3- **Literature review**: Literature review or narrative review is a kind of review article. A literature review is a scientific paper which provide current knowledge including substantive findings as well as theoretical and methodological contributions to a specific topic.(Baglione, L. 2012).

Theories guiding the study: Cognitive therapy: where this model assumes that a person's misconceptions and misleading ideas and thoughts lead to cognitive, emotional and behavioral disorders. It includes several cognitive theories, which are: emotional rational therapy, realistic therapy, cognitive behavioral therapy. The therapeutic intervention of the cognitive approach is aimed directly at changing irrational thoughts and inappropriate emotions and patterns of behavior of clients. The social worker uses professional intervention methods that help in teaching the client the logical thinking patterns and when ideas change, the behavior patterns associated with them change. (Abdel-Majid, Abdel-Mawgoud & Abdel-Al, 2008: pp: 157-174)

Methodology: This research belongs to the Literature review type which aims to evaluate the most recent research on the topic of PTSD symptoms among recovering patients, the public, or healthcare workers facing an outbreak of the Corona virus, and the following procedures were deployed: A- evaluation of the research that have addressed PTSD symptoms among recovering patients, the public, or health care workers facing an outbreak of the Corona virus.

B- Physical analysis of the sample: The timeline for the subject of the analysis represents 2020 researches only, which provides the most recent results as one of the requirements of the current research. Articles indexed in PubMed online database and NCBI were reviewed. The search terms were combined with the Boolean operator as follows: "(PTSD) or (PTSD and Corona virus disease 19 or COVID-19)". The study included (45) studies out of a total of (505) (119 PubMed-386NCBI) (4), of which were on symptoms of PTSD among the recovering patients, and (22) of them were on symptoms of PTSD among the public, and (19) On symptoms of PTSD among health care workers. Selection criteria for studies: I have included articles that meet the following inclusion criteria: 1-Original studies of

researchers investigating symptoms of PTSD in recovering patients, the public, or HCWs facing a COVID-19 outbreak. 2- Printed or published articles 3- Researches 2020. Exclusion criteria were: (a) Full text not available; (b) Not available in English. C- Categories of evaluation: This research relied on the following categories: By (number of both the researchers, and the participants - tools - country - psychological symptoms).

Results: (1) Studies of PTSD during the COVID-19 pandemic among patients with COVID-19 and the general population.(**Each study contains authors, study tools, Study sample, Mean Age, Country, Psychological symptoms, Main findings):**

1. **Forte, Favieri, Tambelli & Casagrande, 2020 :** a web-based cross-sectional survey, 2286 – 1706 women, 29.61(18 – 74), Italian, general distress, sleep disturbance, significant correlations were found between scores of COVID-19-PTSD, general distress, and sleep disturbance. A high incidence of PTSD symptoms (29.5%) in the Italian population.
2. **Wang C., et al.,, 2020:** an online survey, 1738, 11-60, China, Stress, anxiety, depression, moderate-to-severe stress, anxiety and depression were noted in 8.1%, 28.8% and 16.5%, respectively and there were no significant longitudinal.
3. **Tang et al., 2020:** an online survey, 2485, 1525 females 960 males, 19.81 (16–27), China, Depression feeling extreme fear, short sleep durations, the PTSD and depression prevalence were found to be 2.7% and 9.0%,feeling extreme fear was the most significant risk factor for psychological distress, followed by short sleep durations.
4. **Brooks et al., 2020:** Using three electronic databases, 3166 papers, 24 included, 16–24, London, PTSD, confusion, anger, Most reviewed studies reported negative psychological effects including PTSD confusion, anger. stressors included longer quarantine duration, infection fears, frustration, boredom, inadequate information.
5. **Liu et al., 2020b**: An online survey Scales, 898, 18-30, U.S, Depression, anxiety, loneliness. High levels of depression (43.3) high anxiety scores (45.4%,), and high levels of PTSD symptoms (31.8%,). High levels of loneliness, high levels of COVID-19-specific worry, and low distress tolerance were significantly associated with clinical levels of depression, anxiety, and PTSD symptoms.
6. **Liu et al., 2020d:** PTSD Checklist for DSM-5, 285, > 18 years, China, Poor sleep quality, negative alterations in cognition or mood, that the prevalence of PTSD in China hardest-hit areas a month after the COVID-19 outbreak was 7%Women reported significant

higher PTSD, negative alterations in cognition or mood, and hyper-arousal.

7. **Liang et al.,2020:** Questionnaire PTSD Checklist-, 584, 14-35, China, Psychological problems, 40.4% of the youth group had a tendency to have psychological problems. this was evidence that infectious diseases, such as COVID-19, may have an immense influence on youth mental health.
8. **Tan et al., 2020:** an online survey Scales, 673, 30.8, male, 74.4%, China, PTSD, stress anxiety, depression, 10.8% of workforce met the diagnostic criteria for PTSD just returning to work during the COVID-19 epidemic.
9. **Qi et al., 2020**: Questionnaire-, PTSD CheckList, 41, 47 females 44.8%, China (PTSD), anxiety, depression, fatigue, 43.9% presented with impaired general mental health, 12.2% had PTSD symptoms, 26.8% had anxiety, depression symptoms, 53.6% had fatigue.
10. **Chevance et al., 2020:** A narrative review, 44, No, France, Mental, disorders, the major vulnerabilities among patients suffering from mental disorders during this epidemic 1- medical comorbidities (cardiovascular and diabetes) 2- The elderly are at higher risk of contracting the Covid-19. 3- Cognitive and behavioral disorders 4- Psychological weakness.
11. **Röhr et al., 2020:** MEDLINE database.,13 identified studies, No , German, Depressive, anxiety, anger,. isolation, quarantine measures during serious coronavirus outbreaks have extensive negative results for mental health.
12. **Huckins et al., 2020:** Questionnaire, 217 (147 female)18 - 22 ,US, Anxiety depression, People in fall 2020 were more anxious and depressed. A variety of behaviors, including increased phone use, decreased physical activity, fluctuations in news reporting for COVID-19.
13. **Mazza et al., 2020:** PTSD Checklist for DSM-5 scales, 402 (265 male), 57.8(18- 87), Milan, Depression, anxiety, insomnia, obsessive-compulsive (OC),28% for PTSD, 31% for depression, 42% for anxiety, 20% for OC symptoms, and 40% for insomnia. Females suffered from more for both anxiety and depression. This indicates the distressing impact of COVID-19 infection on mental health.
14. **Cai et al., 2020:** PTSD- scales.,126(52.4%) women, 11 - 72,China,Stress response, anxiety, depression, the global prevalence of psychological distress among the 126COVID-19 survivors in early

convalescence is 54.8%, with 31%, 22.2%, and 38.1% meeting the criteria for excessive stress, anxiety, and depression, respectively.

15. **Karatzias et al., 2020:**The survey online, 1,041, 18 years or older, Ireland, Anxiety depression,COVID-19 PTSD was associated with younger age, male gender, city living, living with children, medium and high risk of developing COVID-19 infection, and positive screening for anxiety or depression. PTSD symptoms associated with the COVID-19 epidemic are common among the general population.
16. **Li, 2020:** Online questionnaires.,1109, No, China, Psychiatric disorders, high PTSD level,42.65% and 67.09% self-reported psychiatric disorders and high PTSD level, respectively. Age, occupation, education level were significantly association with psychological status. The status of psychiatric disorders was also related to high PTSD level.
17. **Berthelot et al., 2020:** PTSD DSM-5 (PCL-5), Scales,1754,18 years or older, Quebec, Canada, Depression, anxiety, Pregnant women evaluated during the COVID-19 pandemic reported more distress and psychological symptoms, mainly in the form of symptoms of depression and anxiety.
18. **Elhai, Yang, McKay & Asmundson, 2020:** an online survey, 908, 40.37 (7–64), women 82.82%,China,General anxiety, depression,12% of participants were identified with at least moderate depression, and 24% with moderate anxiety.
19. **Liu, Stevens, Conrad &Hahm, 2020:** A web-based cross,908 (14.1% men, 81.3% women),18-30,U.S., Depression, anxiety, poor sleep, PTSD,higher levels of COVID-19-related worry and grief, poorer sleep, and poorer reported health-related quality of life among those with either a suspected or reported mental health diagnosis. during the initial weeks of the COVID-19 pandemic.
20. **Seyahi, Poyraz, Sut, Akdogan&Hamuryudan, 2020:** An online survey questionnaire, 771 patients, 535 h.w, 917 teachers/academic staff.,No,Turkey,Anxiety ,Depression, sleep problems.,Psychiatric symptoms in patient's and teacher's populations were of considerable clinical concern, despite being significantly lower than that observed among the hospital workers.
21. **Ahmed et al., 2020,** MEDLINE, CINAHL Plus, PsycINFOdatabase,1169, No, UK,PTSD, depression, anxiety, the long term clinical problems in survivors of COVID- 19, infections after hospitalization or ICU admission include respiratory dysfunction, reduced exercise capacity, psychological problems PTSD, depression anxiety, reduced quality of life.

22. **Forte, Favieri, Tambelli & Casagrande, 2020:** An online survey, 229, Least 18, Italian, Anxiety, PTSD, changes in mood, the first weeks of the COVID-19 pandemic appear to impact not only on physical health but also on psychological well-being. evidenced that the diffusion of this pandemic can be related to anxiety, changes in mood, high psychopathological, associated with the development of PTSD.
23. **Wang et al., 2020:** case study,6213 male (52.8%),50.57, China, Depression, anxiety, PTSD, hostility, a high prevalence of mental health problems and gaps in mental health services for cancer patients, which also indicated high distress from COVID-19-elevated risks.
24. **Ginty et al., 2020:** Scales,120, No, U.S, acute psychological stress, Diminished heart rate responses (lower physiological arousal) to acute psychological stress prior to the COVID-19 pandemic significantly predicted reported PTSD symptoms during the crisis.
25. **Liang et al., 2020:**The PTSD Checklist,570- 205 males 365 females,14 - 35,China,sleep disorders, separation anxiety, that 12.8% of with the symptoms of PTSD and the effects of psychological distress was mediated by negative coping sty.
26. **Alkhamees, Alrashed, Alzunaydi, Almohimeed &Aljohani, 2020:** An online survey scales,1160, No, Saudi Arabia, Depression, Anxiety Stress, throughout the early stage of the COVID-19 outbreak in Saudi Arabia, the results showed that nearly one-fourth of the sampled general population experienced moderate to severe psychological impact.

(2) Studies of PTSD symptoms during the COVID-19 pandemic among health care workers (HCWs) . (Each study contains authors, study tools, Study sample, Mean Age, Country, Psychological symptoms, Main findings):

27. **Beidas & Wiltsey Stirman, 2020:** a narrative review, 40, No, French ,stress, anxiety, depression, burnout, addiction ptsd ,There is a consensus in all the relevant literature that HCWs. are at an increased risk of high levels of stress, anxiety, depression, burnout, addiction and ptsd, which could have long-term psychological implications..
28. **Huang, Han, Luo, Ren & Zhou, 2020:** Disorder Self- rating Scale, 246, No, China, Anxiety, stress disorder. In the COVID-19 epidemic, the incidence of anxiety, stress disorder among medical staff is rising. including severe, moderate and mild anxiety, and the rate of anxiety and PTSD among the medical staff was higher than that of males, and the rate of anxiety among nurses was higher than that of doctors.

29. **Chew NWS, et al., 2020:** Questionaire, Scales,906, 25–35, Singapore and India,anxiety, stress, (PTSD)..,demonstrates a significant association between the prevalence of physical symptoms and psychological outcomes among hcws during the COV-19 outbreak.
30. **Shahrour&Dardas, 2020**,A web-based survey.,448 (73% females) 32.0 (20-58), Jordan,Psychological distress, PTSD, nurses (64%) are experiencing ASD due to the COVID-19 pandemic and thus are at risk for PTSD predisposition.(41%) are also suffering significant psychological distress. Younger nurses are more prone to experience psychological distress than older ones.
31. **Wang et al., 2020:** Questionnaire ,202,32.00.,China,PTSD,The incidence of PTSD in Nurses exposed to COVID-19 was 16.83%,, and the highest score in the three dimensions was avoidance dimension 9.50.
32. **Di Tella, Romeo, Benfante&Castell, 2020:** PTSD Checklist for DSM-55.,145, 42.9, Italia ,psychological distress, (PTSS).,A comparison of HCWs on COVID-19 wards and other units revealed that the former reported higher levels of symptoms of depression and PTSD. being female and not in a relationship was found to be associated with higher levels of depressive symptoms, while being female and being older was found to be associated with higher levels of PTSD.
33. **Song et al., 2020:** electronic questionnaires,14,825,34.0, China, Depressive, PTSD, the prevalence rates of depressive symptoms and (PTSD) were 25.2% and 9.1%, respectively. Men were more likely to have depressive symptoms and PTSD than women. Those who were middle aged, worked for fewer years, had longer daily work time, and had lower levels of social support were at a higher risk of developing depressive symptoms and PTSD.
34. **Stuijfzand et al., 2020,** PubMed, PsycINF, Web of Science.,1308, 50 were included, No, No, Psychological distress, insomnia. PTSD, depression, burnout, anger, higher perceived ,HCPs working with patients during an epidemic/pandemic are at heightened risk of mental health problems in the short and longer term, particularly: psychological distress, insomnia, alcohol/drug misuse, and symptoms of PTSD, depression, anxiety, burnout, anger, and higher perceived stress.
35. **Carmassi et al., 2020:** PubMed Scale,24,No,No,PTSS and PTSD, stress, anxiety, depression, Quarantined HCWs consistently showed more frequent adverse psychological impacts than non-HCWs

36. **Liu D, et al., 2020c.:** A cross-sectional survey.,675 ,55.,Wuhan, China, Anxiety, depression, PTSD, Adverse mental health effects of COVID-19 are evident after discharge from the hospital, with sleep difficulties .preventing and addressing social stigma associated with COVID-19 may be crucial for improving mental health for recovered patients.
37. **Preti et al., 2020:** PubMed, PsycINF, and Web of Science,44,No,No,Severe anxiety, depressive, ptss,73.4% of HCWs, reported ptsd symptoms during outbreaks, with symptoms lasting after 1-3 years in 10-40%. Depressive symptoms 50.7%, insomnia symptoms 36.1%, anxiety symptoms in 45%. General psychiatric symptoms during outbreaks have a range comprised between 75.3%; high levels of stress related to working in 80.1%.
38. **Li et al., 2020:** Questionnaire survey, 740,22-38,Wuhan, China, Anxiety, psychological stress, that the indirect trauma scores for frontline nurses including scores for physiological and psychological responses were significantly lower than those for non-frontline nurses . the scores for indirect trauma for the general population were significantly higher than those for front-line nurses
39. **Yin et al., 2020:** Scales,377,18–60, China, ptsd- sleep quality, that 1 month after the outbreak, PTSSs was 3.8% in HCWs. Female HCWs were more vulnerable to PTSSs. HCWs with higher hyperarousal symptoms. There was a significant difference of sleep quality between participants with and without PTSSs.
40. **Jin et al., 2020:** a cross-sectional survey,105(64 females), 35.0,Wuhan, China, Psychological stress,88.3% staff experienced psychological stress or emotional changes during their isolation perio.
41. **Bock, Heitland, Zimmermann, Winter &Kahl, 2020:** Question-aires,(320 280 female,26-35, Germany,Traumatic events, stss, of depression, anxiety, Nurses with secondary traumatic symptoms reported higher depression and anxiety scores, nurses reported significantly reduced work ability, social support and control over work, and increased emotional strain and labor time.
42. **Wu & Wei, 2020:** Scales,120, 25–59, China, Depression, Anxiety, Sleep Quality, moderate insomnia reached 61.67%, and severe insomnia reached 26.67%. There are psychological symptoms and sleep symptoms in front-line medical staff who participate in the fight against COVID-19, they affect each other.
43. **Korkmaz S, et.al, 2020:** Scales, 140(18- 65): Turkia, Anxiety levels, quality of sleep and life, HCWs might develop psychiatric symptoms such as anxiety and sleep disturbance. Such symptoms could adversely

affect the problem-solving skills of HCWs and cause a deterioration in their quality of life.

44. **Al-Hanawi et al., 2020:** Question-aire,3306 31.35% hw,18-60,Saudi,Psychological distress,40% of the Saudi population are distressed due to COVID-19, of 33% are mildly distressed, while 7% are severely distressed. The distress levels are particularly high amongst the young, females, private sector employees and HCWs, especially those working on the frontline.
45. **Shechter et al., 2020:** A cross-sectional survey ,657- Women 70.9%,25-34,N.Y,Acute stress, depressive, anxiety, NYC HCWs, especially nurses and advanced practice providers, are experiencing COVID-19-related psychological distress.

Features of included studies: First: the number of researchers and co-authors participating in the achievement of the research: table No.1 and 2 show that more than six researchers participated in most of the studies, n= 31 studies out of 45 studies, with the percentage of 68.8%, Second: the state: the research showed that most of the studies were from China, due to the fact the first outbreak of the virus was in China. 17 of the studies were performed in China, 37.7% of the total number of the studies, n= 45 studies, third: study tools: most of the studies, 25 studies representing 55.5% of the studies used in the research, n= 45, deployed a web-based cross-sectional survey, forth: the psychological symptoms among COVID-19 patients: the results showed that four studies were applied on COVID-19 patients and the study of Qi et al. (2020) suggested that 43.9% of 41 patients suffered from weak general mental health, 12.2% revealed the PTSD symptoms, 26.8% suffered from anxiety and/ or depression and 53.6% suffered from fatigue. The study of Mazza et al. (2020) revealed, in agreement with the previous study, that 28% of a total number of 402 recovering patients had PTSD, 31% suffered from depression, 42% had anxiety, 20% had OC symptoms and 40% suffered from insomnia. The study of Cai et al. (2020b) showed that the rate of psychological distress among COVID-19 survivors during their early period of recovery was high. The percentage of psychological distresses among 126 COVID-19 survivors during early recovery period was 54.8%, in addition to, 31%, 22.2% and 38.1 of them meeting the criteria of excessive fatigue, anxiety and depression respectively. The study of Ahmed et al. (2020) concluded that after analyzing 28 of a total of 1,169 studies, COVID-19 survivors suffered from long-term clinical issues such as SARS and MERS after being hospitalized or admitted to the intensive care unit and psychological problems such as PTSD, depression, anxiety, and a decreased quality of life. Fifth: the psychological symptoms of the public during the outbreak of

Covid-19 disease: the study of Forte, Favieri, Tambelli and Casagrande (2020) indicated significant correlations between scores of COVID-19 and PTSD, generalized anxiety, depression, stress, and sleep disturbances, in accordance with the results among the population in Italy and Ireland (Karatzias et al., 2020), and among the Chinese public (Liu et al., 2020c; Wang et al., 2020a). Liang et al. (2020b) and (Li, 2020) and in Saudi Arabia as indicated by studies of (Elhai, Yang, McKay & Asmundson, 2020) and (Alkhamees et al., 2020).

Psychological symptoms during home quarantine: These included stress, prolonged home quarantine, fear of infection. depression, boredom, scars, PTSD symptoms, confusion and anger (Brooks et al., 2020; Röhr et al., 2020).

Psychological symptoms among young people during the outbreak of Covid-19 disease: The study by Huckins et al. (2020) and Tang et al. (2020) indicated that university students showed an increase in anxiety and depression during the 2020 winter due to COVID- 19. Studies of Liu, Zhang, Wong, Hyun and Hahm (2020b) and Liu, Stevens, Conrad and Hahm (2020a) also confirmed a relationship between high levels of loneliness and anxiety caused by the Corona virus. COVID- 19 and decreased tolerance combined with clinical levels of depression, anxiety, and PTSD were found among young adults in a study by(Liang et al., 2020a). Emotional symptoms among chronic disease patients during the outbreak of Coronavirus 19: A study by (Seyahi, Poyraz, Sut, Akdogan & Hamuryudan, 2020) confirmed the presence of symptoms of anxiety, depression, and PTSD among RD patients during the COVID-19 outbreak, as well as, among cancer patients (Wang et al., 2020b) The main vulnerabilities among patients with mental disorders during this pandemic are summarized in cardiovascular disease, risk, behavioral and cognitive disorders, and psychological impairment, (Chevance et al., 2020; Ginty et al., 2020).

Sixth: psychological symptoms among HCWs during the outbreak of COVID- 19: There is unanimous agreement among the relevant literature that healthcare professionals working with COVID-19 patients are at increased risk of developing high levels of anxiety, distress, depression, and fatigue, in addition to, the symptoms of PTSD (Al-Hanawi et al., 2020; Beidas & Wiltsey Stirman, 2020; Carmassi et al., 2020; Di Tella, Romeo, Benfante & Castelli, 2020; Huang, Han, Luo, Ren & Zhou, 2020; Preti et al., 2020; Stuijfzand et al., 2020; Yin et al., 2020). The rates of anxiety were higher among nurses than among physicians. (Wu & Wei, 2020) and (Korkmaz et al., 2020).

A significant correlation between the outbreak of physical symptoms and psychological consequences among HCWs during the COVID- 19 outbreak was confirmed by a study by (Chew et al., 2020). Also a study by (Song et al., 2020) confirmed that risk factors associated with developing PTSD were higher among HCWs who were in middle age, worked fewer years, longer daily working hours and less social support.

Discussion: These studies addressed several issues related to PTSD symptoms during the outbreak of the Coronavirus where several symptoms were included. Thus, several studies included two types of psychological problems, namely: increased anxiety associated with depression, as in 12 studies that dealt with patients and recovered patients during the outbreak of the Corona virus were examined, as well as, studies of psychological symptoms for the public during the outbreak of Covid-19 disease.

Eight studies indicated the effect of trauma during the outbreak of the Coronavirus on sleep disturbances or insomnia among recovered patients, the public, as well as, HCWs suffering from insomnia. Studies have also indicated that physicians who worked with patients during the pandemic tend to have an increased risk of both short and long-term mental health problems.

Studies have also indicated other symptoms of coronavirus outbreak trauma, such as stress (Cai et al., 2020b; Qi et al., 2020), decreased quality of life (Ahmed et al., 2020) and negative changes in mood, perception, Intense arousal (Wang et al., 2020a), confusion, anger, fear of infection, depression, boredom, and stigmata (Röhr et al., 2020) and (Brooks et al., 2020), severe fear (Tang et al., 2020) Loneliness (Liu et al., 2020b), grief (Liu et al., 2020a) and socio-economic vulnerability due to stigma (Ginty et al., 2020) and drug and alcohol abuse (Stuijfzand et al., 2020).

Several studies concluded that PTSD symptoms had different proportions in male and female participants as women reported significant increases in PTSD symptoms, negative changes in mood and cognition, and intense arousal. The rate of anxiety among the medical staff was higher among the male members and the rate of anxiety among nurses was higher than among doctors.

The results of some studies indicated that the main risk factors associated with COVID-19 for developing PTSD were young age, male gender, city living, living with children, moderate and high risk of infection. While among the chronic disease patients the main risk factors related were; age, occupation and educational level. Closely related to psychological state among medical care workers has the following characteristics: middle age, fewer years of work, longer daily working hours, lower levels of social support, who were more likely to develop

PTSD. Younger nurses were more likely to be stressed than older nurses and it was found that being an older woman was associated with higher levels of PTSD. Indirect trauma scores for the public were higher than those of frontline nurses. High stress levels were particularly associated with youth, females, private sector employees, and medical workers, especially those who work on the front lines. Some research highlights some flexible portfolios of ability factors such as training support, immediate action organization, and good coping strategies.

Conclusion: There are many indications which suggest increases in the levels of PTSD symptoms occurrence among; patients after being infected with COVID- 19, the public and HCWs. These symptoms included anxiety and depression, strain, sleeping disorders or insomnia, decline of life quality, general distress, negative changes in mood and cognition, extreme excitement, confusion and anger, fear of contagion, boredom, stigmata, loneliness, social and psychological weakness due to the stigmata and drug and alcohol abuse.

The research revealed that risk factors which can be indicators of the individuals more inclined to suffer PTSD are: young age, sex (females), living in the city, living with children, moderate and high risk of catching COVID- 19, chronic disease patients, type of occupation, educational level, middle- aged HCWs with less number of working years, longer working hours and less levels of social support.

Some research highlight on the necessity to take all the proper precautionary measures to control the PTSD symptoms and to prevent their deterioration so they will not affect individuals' social and psychological life and have negative impact on their quality of life.

Most of the studies examined the symptoms and the risk factors and suggested some solutions without making any proposals in terms of effective programs. Therefore; the researcher designed a proposed program to control the PTSD symptoms by offering protection to the public, the patients, the recovering patients and the HCWs in order to take all the necessary precautionary measures during any potential future pandemics.

Limitations: The strengths of this review include that; it was systemically performed, most of the studies were undertaken in Europe, except two from Asia, the data of most of the studies reviewed and evaluated were collected online and the PTSD symptoms evaluation indicate the necessity of having programs in the future.

A program to reduce PTSD symptoms:

Program objectives: (General objective): to mitigate the symptoms of PTSD symptoms among recovering patients, the public or HCWs during the outbreak of COVID- 19 using the behavioral cognitive therapy approaches through achieving the following secondary objectives:

- Identifying the nature of the unreasonable thoughts that lead to the disorders such as catching or re-catching the infection, death, fear for the family and defining the improper emotions related to such thoughts for Discussion and change.
- Making the targeted groups gain the ability of correct thinking and adopting correct believes that will help to follow the proper behavior in life.
- Helping the targeted groups to have the psychological flexibility, by understanding the trauma impact and helping them to control their emotions and reaching the inner peace.
- Helping the targeted groups gain several social skills that will help them on future self- management.

Program steps:

- Building strong relations between the worker and the client to achieve effective participation by the latter.
- Estimating the problem through determining the client's disorder's reasons and severity, as well as, the unreasonable thoughts. The client also should be helped to eliminate the negative feelings and emotions related to such thoughts.
- Helping the client to gain new behavioral skills that will enable logical thinking, right cognition, adopting correct believes that will lead to positive behaviors in life
- Monitoring the extent of change in client's condition through verifying adoption of the right thoughts, alongside with, measuring his/ her disorder severity.

Program's strategies:

- The strategy of re- building cognitive structure aiming at helping the client gain new cognitive aspects that are related to the severity of PTSD symptoms' impact on the client's future and how to eliminate the disorder, deploy new realistic, reasonable and constructive thoughts on the daily practices and interactions with others.
- Impulse control strategy: identifying the impulses influencing client's life and related to the PTSD symptoms and helping the client to control such impulses.
- Behavior modification strategy: to convince the client to adopt the new behavior and to practice it for the purpose of improving quality of life.

- Self- aiding strategy: supporting the client's self- abilities and self-development, in order to, make changes in client's values and attitudes.

Program Techniques:

1. Group discussion: by discussing the issues related to the PTSD symptoms that cause client's disturbed behavior, which one of the clients face the rest of the group with the same PTSD related symptoms, and discussing the unreasonable thoughts linked thereto, as well as, the available alternatives.
2. Clarifying: Explaining the negative thoughts leading to the disorder and reflected on client's future and clarifying the recovery ratios.
3. Support and Encouragement: Aims at giving the client the confidence through using encouraging words for positive thoughts, emotions and behaviors and maintaining such behaviors and the thoughts related to them.
4. Training to endure pressures: aims at giving the client the ability to handle pressures and increasing the client's resistance to such pressures. This process is executed through three main stages: Educational Stage, Training Stage and Practical stage.
5. Confrontation: Where the client is confronted with the trauma and its impacts, not ignoring the pressing situations and discussing them with family and friends.
6. Advice and guidance: in which the researcher constantly provides the client with correct information and guidance that will enable training on sound thinking and logical analysis of the wrong thoughts to eliminate or reduce the disorder behaviors.
7. Cognitive representation: It encourages mental imagination in order for the client to envision new solutions to his problem and replace false ideas with more rational ones.
8. Meditation method: by retrieving problematic causes, in order to discover that his self-talk using defeated terms, resulting from irrational thoughts, is a major cause of his troubles.
9. Self-reports: What is meant is to make a daily record of the phrases or sentences that the client says to himself about the events and situations he is exposed to.
10. Training in social skills: include asserting oneself, facing pressure, relaxation, solving problems, anger management, modifying internal dialogue.

Roles applied in the program include; mentor, modifier, evaluator, motivator, trainer, help, consultant and data analysist.

Tools deployed in the program: group interviews, individual interviews (for some cases requiring them, as well as, patient's family), group discussions and observation.

Skills required for the program: professional relationships, trauma handling, communication, and listening, observation, emotional support, motivation and conversation management.

Program evaluation: through applying the PTSD symptom scale, observing respondents' behavior and analyzing interviews with respondents and their families.

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