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ORIGINAL ARTICLE

Risk Factors of Post-Traumatic Stress Disorder and Coping Strategies of Emergency Medicine Physicians during the COVID - 19 Pandemic

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ABSTRACT

The emergency medicine physicians are at the frontlines of the management of COVID-19 and are vulnerable to the negative mental health effects brought about by the pandemic.

OBJECTIVES

This study aims to determine the presence of risk factors of post-traumatic stress disorder among EM physicians and identify their coping strategies.

METHODOLOGY

This cross-sectional analytic research utilized a self-administered questionnaire to gather information on demographic profile, workplace environment, the Impact of Event Scale-Revised (IES-R), risk perception of COVID -19, and coping strategies.

RESULTS

The majority of the 167 respondents were 26 to 40 years old (69%), single (57%), had no children (59%), and were less than 5 years in practice (60%). The presence of symptoms of post-traumatic stress was identified among EM physicians directly handling covid-19 patients. IES-R scores revealed that 34% of respondents had favorable results, 21% had scores between 24 to 32 wherein PTSD is a clinical concern, 27 (16%) had scores between 33 to 38 which represents the best cutoff for a probable diagnosis of PTSD, and 48 respondents (29%) had clinically important scores of 39 and above. There were multiple coping strategies identified, but the availability of free food was the only significant factor in reducing the risk factors of PTSD by 76% based on the multiple logistic regression model.

CONCLUSION

Protecting the mental health of EM physicians is an important component of public health measures for addressing the COVID-19 epidemic. Interventions to promote mental well-being among EM physicians and residents need to be immediately implemented.

KEYWORDS: emergency medicine, covid-19, post-traumatic stress disorder, mental health, pandemic

INTRODUCTION

Background

The mental health of emergency physicians in a global pandemic may take a backseat as they go through their duties and responsibilities.[1] The coronavirus disease (COVID-19) or Severe Acute Respiratory Syndrome Novel Coronavirus 2 (SARS-CoV-2) was believed to have started in Wuhan, China in December 2019 and was classified as a pandemic by the World Health Organization (WHO) on March 11, 2020. The outbreak has caused additional health problems like anxiety, stress, depression, and fear globally.[2]

There were 1,638,345 RT-PCR confirmed covid cases tested in Department of Health (DOH) certified facilities as of August 6, 2021.[3] Patients treated for COVID -19 in isolation may experience fear, anxiety, and stigmatization. Doctors, nurses, and other frontline healthcare workers managing these patients also experience the same mental health conditions.[4] With the increasing number of health work-ers infected with the virus, the psychological stress of caring for patients affects decision-making.[4]

Importance

Identification of post-traumatic stress is important since it affects several dimensions. This could lead to an increased risk of addictive behaviors, suicide attempts, psychiatric comorbidities, and organic pathologies such as coronary heart disease.[5] On the organizational level, post-traumatic stress and its consequences on work can lead to growing staff shortages through sick leaves and an exodus of traumatized people.[6,7]

According to Cyrus et.al., it is important to safeguard the moral and mental health of healthcare workers as this can influence the success of health care delivery.[2] It is vital to identify those who are burned out or have psychological distress so that timely intervention can be provided, and staff should be encouraged to step forward without fear of being blamed. Any rumors or news from unverified sources can also increase the anxiety and negative emotions during such traumatic incidents. [8]

The Philippine College of Emergency Medicine (PCEM) released several guidelines to help its members respond to the global pandemic. PCEM currently has 19 training institutions and close to 300 active members working in various hospitals locally. It offered support to emergency medicine (EM) physicians by providing personal protective equipment (PPE) for those needing them.

Objectives of the Study

The main objective of this study is to determine the presence of risk factors of post-traumatic stress disorder among emergency medicine physicians and their coping strategies. Specific objectives include: determining the prevalence of post-traumatic stress disorder among emergency medicine physicians and determining the modifiable risk factors for post-traumatic stress disorder. Results of this study will aid in intervention strategies and further prevention of post-traumatic stress.

METHODS

Study Design and Setting

This is cross-sectional analytic research utilizing a self-administered survey questionnaire on a sample of emergency physicians, consultants and residents, working in the Philippines. The duration of the study was two months, from January to March 2021. During this period, the total confirmed cases of COVID-19 in the Philippines was 747,288, with 13,297 total deaths and 603,746 recoveries.[9]

Ethical approval was obtained from the Institutional and Ethical Review Board of St. Luke's Medical Center (SLMC) before the initiation of the study. The study was endorsed by the research committee of the Philippine College of Emergency Medicine (PCEM).

Selection of Participant

Included in the study are fellows, diplomates, and resident physicians practicing in emergency departments or urgent care clinics in the country during the COVID-19 pandemic and have consented to be participants. Exclud-ed are EM physicians not in active practice, retired, those working in cruise ships, and those practicing outside the Philippines.

A stratified sample of hospital-based EM physicians participated in the study. From an estimated population of 300 active EM physicians, the study used the prevalence rate of 6 to 7% among health care workers. This was based on a previous study by Tan et al on the psychological impact of the COVID-19 pandemic on health care workers in Singapore.[10] The computed sample size with a confidence level of 95% was 170 participants. The self-administered questionnaire was sent to 190 EM physicians through email. Investigators ensured the anonymity of answers by sending unique code questionnaires to the participants.

Interventions

Data were collected using an anonymous structured self-report questionnaire distributed online through social software (Google Forms: https://forms.gle/8-ugRFZBM8uKSksjY6). The questionnaire consisted of five parts: (1) Demographic Profile, (2) The Workplace Environment, (3) The Impact of Event Scale-Revised, (4), Perception of Risk for COVID -19 in the Workplace, and (5) Coping Strategies. Only a single response was allowed for each EM physician.

Measurements and Outcome

Psychological stress was measured with the Impact of Event Scale-Revised (IES-R). IES-R had 22 questions, five of which were added to the original Horowitz (IES) to better capture the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria for PTSD.[11] This tool is an appropriate instrument to measure the subjective response to a specific traumatic event in the older adult population, especially in the response sets of intrusion (intrusive thoughts, night-mares, intrusive feelings and imagery, dissociative-like re-experiencing), avoidance (numbing of responsiveness, avoidance of feelings, situations, and ideas), and hyper-arousal (anger, irritability, hypervigilance, difficulty concentrating, heightened startle). The IES-R was not meant to be diagnostic of PTSD. The higher the score the greater the concern for PTSD and associated health and well-being consequences. [12]

Analysis

Descriptive statistics were used to report the demographic data. For data analysis, a multiple logistic regression model with quantitative and categorical exposure variables was constructed. This technique was used since the dependent variable, presence or absence of PTSD, is dichotomous, with a cut-off of IES-R of greater than 32 for the presence of PTSD. The fit of the model was assessed by interpreting the coefficient of determination, R^2. This coefficient tells the proportion of total variation in the outcome variable explained by the exposure variables that were entered in the model. Summary measures and data analyses were done through the use of STATA version 14.

RESULTS

Characteristics of Study Subjects

Out of the 190 target EM physicians, 167 (87%) consented to be included in the study. Of the 167 respondents, there was an almost equal number of males and females, 82 (49%) and 85 (51%). The majority (116, 69%) were in the age group between 26 to 40 years old, followed by the 41-60 age group (48, 29%). Most were single (95, 57%), while 71 (43%) were married. The majority of the respondents (98, 59%) had no children. (Table 1)

Most of the respondents were EM consultants (90, 60%). Among the EM residents, 9 (12%) were in Level 1, 22 (30%) were in Level 2, 22 (30%) were in Level 3, and 21 (28%) were in Level 4. The majority have been trained in emergency medicine for at least one year during the conduct of this study. The majority of the respondents (97, 60%) were in EM practice for less than 5 years, 31 (19%) were between 5 to 10 years, and 35 (21%) were more than 10 years in practice.

For the location of the main practice, 112 (67%) were in the National Capital Region (NCR) and 55 (33%) practiced outside NCR. Most were affiliated with private hospitals (83, 50%), while 27 (16%) worked in both government and private hospitals. The majority of the respondents (106, 63%) did not have any comorbidities. (Table 1)

Variables	Number (%)
Sex	
Male	82 (49.10)
Female	85 (50.90)
Age	
<25 Years	1 (0.60)
26-40 Years	116 (69.46)
41-60 Years	48 (28.74)
>60 Years	2 (1.2)
Civil Status	
Single	95 (56.89)
Married	71 (42.50)
Separated	1 (0.60)
Number of Children	
None	98 (56.68)
1	31 (18.56)
2	29 (17.37)
3	6 (3.59)
4	2 (1.20)
5 or more	1 (0.60)
Occupation	
Consultant	90 (59.51)
Year 1 Resident	9 (12.16)
Year 2 Resident	22 (29.73)
Year 3 Resident	22 (29.73)
Year 4 Resident	21 (53.89)
Resident (missing data on year level)	3 (1.79)
Years of Practice	
<5	97 (59.51)
5-10	31 (19.02)
>10	35 (21.47)
Missing data	4 (2.39)
Location of Main Practice	
NCR	112 (67.07)
Outside NCR	55 (32.93)
Hospital Affiliation	
Private	83 (49.70)
Public	57 (34.13)
Both	27 (16.17)
Comorbidities (More than 1 answer)	
None	106 (63.47)
Hypertension	24 (14.37)
Asthma/Lung Disease	24 (14.37)
Diabetes Mellitus	8 (4.79)
Allergic Rhinitis	4 (2.40)
Heart Disease	3 (1.80)
Others	3 (1.80)

Table 1. Summary of Demographic Characteristics of EM Physicians (N = 167)

Table 2 shows that the majority of the respondents claimed that their hospitals provided them with full or adequate PPE (94%), free food (70%), hazard pay (59%), scrub suits (53%), free admission in the hospital (47%), free vitamins (41%), psychological services (38%), free accommodation (29%), free transportation (16%), and free grocery items (14%).

Policies and information were mostly relayed through internal memos (84%), internal chat groups (66%), and announcements by persons in authority (83%). Respondents said that policies were usually changed every week (42%) and the majority (72%) were satisfied with the information given to them.

Variables	Number (%)
Support from Hospital	
(more than 1 answer)	
Full/ Adequate Personal Protective Equipment (PPE)	156 (93.41)
Free Food	117 (70.06)
Hazard Pay	98 (58.68)
Scrub Suit	88 (52.69)
Free Admission in the hospital	79 (47.31)
Free Vitamins	69 (41.32)
Psychological Services	64 (38.32)
Free Accommodation	48 (28.74)
Free Transportation	26 (15.57)
Free Grocery items	23 (13.77)
Others: moral support, participation in policies,	4 (2.40)
no increase in swab fee or consultation	

Policy Information and Dissemination	
Internal memo	140 (83.83)
Internal chat groups	111 (66.47)
The announcement by the person in authority	139 (83.23)
Frequency of Policy Changes	
Every week	70 (41.92)
As necessary	43 (25.74)
Every day	23 (13.77)
Every month	21 (12.57)
Every 2 months	4 (2.40)
Quarterly	1 (0.60)
New problems/ new policies	5 (2.99)
Satisfaction with Information	
Yes	121 (72.46)
No	46 (27.54)

Table. 2 Summary of Workplace Characteristics

Main Results

IES-R scores of the respondents fell on one of the 4 categories: (1) < 24, (2) 24 to 32, (3) 33 to 38, and (4) 39 and above. This tool measures the subjective response to a specific traumatic event in the response sets of intrusion, avoidance, and hyper-arousal. Scores higher than 24 are significant. IES-R scores were as follows: 56 (34%) of the respondents had favorable scores of less than 24, while 35 (21%) had a score 24 to 32, 27 (16%) had a score of 33 to 38, and 48 (29%) had a score of 39 and above. (Table 3)

IES-R scores	Scores (%)
(n=166)	Mean (SD) - 30.72 (14.57)
<24	56 (33.73%)
24-32	35 (21.08%)
33-38	27 (16.27%)
39 and above	48 (28.92%)
*1 subject failed to answer all questions	

Table 3. The Impact of Event Scale-Revised (IES-R) Scores

*Score Interpretation (IES-R):

24-32: PTSD is a clinical concern

33-38: This represents the best cutoff for a probable diagnosis of PTSD

39 and above: This is high enough to suppress your immune system.

In terms of EM physicians' risk perception seen in Table 4, the majority of the respondents (143, 86%) felt that the level of PPE supplied by the hospital provided adequate protection against COVID-19. The majority of the respondents (136, 81%) said that their present work environment exposed them to an increased risk for COVID-19 infection. Also, 138 (83%) of the respondents felt that infection control policies in their institution helped in reducing the risk of exposure to COVID-19 infection.

A total of 65% (108) of respondents said that their present manpower distribution in the ED increased the risk for COVID-19 infection. About 70% (117) believed that their institution's policy on testing for COVID-19 infection among healthcare workers helped reduce or monitor their risk of infection.

For the coping strategies of EM physicians in Table 5, on top of the list is having a good sleep or rest (141, 84%), followed by talking to friends and family (128, 77%), watching movies at home (125, 75%), eating (120, 72%), use of social media (115, 69%), praying (104, 62%), exercising (76, 45%), gardening (28, 17%), and participating in online courses (26, 15%).

In the univariate analysis, factors that had an odds ratio of >1 were: sex (for males, versus females), wearing of scrub suits, satisfaction with information, perception of risk related to the level of PPE provided, workplace environment, COVID-19 testing, and distribution workplace manpower. These were related to higher odds of occurrence of PTSD, but these factors did not reach the

Do the present infection control policies in your institution help reduce your risk of exposure to COVID – 19 Infection?	
Yes	138 (82.63%)
No	29 (17.37%)
Does present manpower distribution in your ED increase your risk for COVID-19 Infection?	
Yes	108 (64.67%)
No	59 (35.33%)
Does the current policy in your institution on testing for COVID-19 Infection among health care workers help reduce or monitor your risk of infection?	
Yes	117 (70.06%)
No	50 (29.94%)

Table 4. Emergency Medicine Physicians' Perception of Risk

Coping Strategies (may choose more than one)	**Number, %**
Good sleep or rest	141 (84.43%)
Talking to friends/family online	128 (76.65%)
Watching movies at home	125 (74.85%)
Eating	120 (71.86%)
Use of social media	115 (68.86%)
Prayers	104 (62.28%)
Exercise	76 (45.51%)
Gardening	28 (16.77%)
Online courses	26 (15.57%)
Online psychiatric intervention	11 (6.59%)
Others	8 (4.79%)
Crafts	5 (2.99%)
Shopping online	4 (2.40%)

Table 5. Coping Strategies of EM Physicians

level of significance.

In the simple logistic regression model shown in Table 6, the predictor variables for PTSD were analyzed individually. It revealed that the availability of free food is the only significant predictor. This model shows that the odds of those who receive free food from the hospital to have PTSD is only 0.48 that of the odds of those who do not receive free food. That is, their odds of having PTSD is 52% lower than those who do not receive free food. This finding is significant with a p-value of 0.03.

In the multiple logistic regression model, where other variables are held constant, the availability of free food is again the only significant predictor of PTSD. This model shows that controlling for all the other variables, the odds of those who receive free food from the hospital having PTSD is only 0.24 that of the odds of those who do not receive free food. That is, their odds of having PTSD is 76% lower than those who do not receive free food. This finding is significant with a p-value of 0.004.

Variables	Simple Logistic Regression		Multiple Logistic Regression	
	Odds Ratio (95% CI)	P-Value	Odds Ratio (95% CI)	P-Value
Sex				
(females as reference)				
Male	1.04	0.9	0.78	0.53
Civil status				
(single as reference)				
Married	0.75	0.37	0.56	0.3
Age				
(<25 as reference)				
26-40	0.87	0.88	0.44	0.64
41-60	0.68	0.81	0.56	0.71
Number of children	0.93	0.66	1.09	0.74
Occupation				
(resident as reference)				
Consultant	0.66	0.19	0.43	0.22
Years of practice				
(<5 years as reference)				
5-10 years	0.83	0.64	1.03	0.96
>10 years	0.78	0.53	0.66	0.68
Location				
(NCR as reference)	0.91	0.78	0.77	0.61
Outside NCR				
Hospital				
(private as reference)				
Government	0.82	0.57	0.43	0.14
Both	0.62	0.29	0.73	0.61
Comorbidities	0.85	0.61	1.01	0.98
Full PPE	0.67	0.52	0.58	0.47
Hazard pay	0.88	0.69	1.05	0.91
Scrub suits	1.52	0.19	1.77	0.21
Free food	0.48	0.03	0.24	0.004
Satisfaction of information	1.6	0.19	1.81	0.87
Perception of Risk				
Does the Level of PPE supplied to you by the hospital provide adequate protection against COVID – 19 Infection?	1.18	0.71	0.98	0.97
Does your present work environment expose you to increased risk for COVID-19 Infection?	1.64	0.23	1.22	0.7
Do the present infection control policies in your institution help reduce your risk of exposure to COVID – 19 Infection?	0.73	0.44	0.54	0.25
Does present manpower distribution in your ED increase your risk for COVID-19 Infection?	1.14	0.69	1.19	0.67
Does the current policy in your institution on testing for COVID-19 Infection among health care workers help reduce or monitor your risk of infection?	1.35	0.38	1.57	0.31
Coefficient of determination (R^2) = 0.10				
Note: Cut-off value used is IES-R score > 32				

Table 6. Logistic Regression, Risk Factors for Post-Traumatic Stress Disorder Model

A coefficient of determination, or R2, the value of 0.10 means that only 10% of the variation in the causes of PTSD can be explained by the factors listed in Table 6. This implies that although the presence or absence of free food for the doctor was associated with the presence or absence

of PTSD, 90% of the variation in the causes of PTSD was due to variables not included in the model used in this study

LIMITATIONS

The study was limited to a one-time observation of the participants based on self-reporting and was not meant to be diagnostic of PTSD. It lacked longitudinal follow-up which is important since cases of covid-19 are still prevalent and the mental health symptoms of EM physicians could become more severe. Long-term psychological effects on this population need further investigation. This study was also unable to distinguish between preexisting mental health's symptoms versus new symptoms. It is recommended to increase the sample size of the study to examine further for the association of variables with the occurrence of mental health problems particularly PTSD.

DISCUSSION

The majority of the survey respondents were aged 26 to 40 years old, single, with no children, and were less than 5 years in practice. This cross-sectional survey enrolled 176 EM physicians and revealed varying levels of mental health symptoms. Only around one-third of respondents (34%) had favorable IES-R scores of less than 24.

The survey revealed that 21% of respondents had scores 24 to 32 wherein PTSD is a clinical concern. Those with scores this high who do not have full PTSD will have partial PTSD or at least some of the symptoms.[11]It was also noted that 27 (16%) of EM physicians had scores 33 to 38, which represents the best cutoff for a probable diagnosis of PTSD.[12]

Forty-eight respondents (29%) had clinically important scores 39 and above. This is high enough to suppress the immune system's functioning even 10 years after an impact event.[12] While emergency physicians are known for their resilience owing to constant exposure to stress in the ED, the COVID-19 pandemic may have brought an unusual burden of stress to consultants and residents being the frontline workers of the hospital.[13] Recent study has shown that there is still a significant gap in provision and accessibility to mental health care in the country. [14]

The IES-R was designed and validated using a specific traumatic event as a reference. A cross-sectional study conducted by Kang et al (2020) involving 994 Wuhan Health care workers used the IES-R tool and noted that 34.4% of respondents had mild disturbance, 22.4% had moderate disturbance and 6.2% had severe disturbance.[4] The main strengths of this revised instrument are the following: it is short, it is easily scored, it correlates better with the DSM Criteria for PTSD, and can be used repeatedly to assess progress. It is limited by its role as a screening tool rather than a comprehensive test and is best used for recent, not remote, traumatic events.[12]

In the COVID-19 situation in Wuhan, medical workers dealt with a high risk of infection and inadequate protection against contamination, overwork, frustration, discrimination, isolation, patients with negative emotions, a lack of contact with their families, and exhaustion. This caused mental health problems such as stress, anxiety, depressive symptoms, insomnia, denial, anger, and fear.[15] These mental health problems not only affect the attention, understanding, and decision-making capacity of medical workers but could have a lasting effect on their overall well-being.[11]

In a study performed by Marco et al among emergency physicians, 22.3% of respondents reported symptoms consistent with PTSD.[16] Sources of stress were workload, disinformation about COVID-19, and concerns with PPE. These findings were similar to what was observed in this study wherein satisfaction with information, risk percep-tion related to the workplace environment, and level of PPE related to the occurrence of PTSD symptoms. How-ever, these factors did not reach the required level of significance.

Shaukat and Razaak (2020), found that healthcare workers experienced high levels of depression, anxiety, insomnia, and distress.[17] Female healthcare workers and nurses were found to be disproportionately affected. In this study majority of our respondents were women (50.9%), but while gender had an odds ratio >1 in the univariate analysis, this did not reach a level of signifi-cance.

A strategy for well-being includes three distinct types of coping mechanisms: physical health and safety, emotion-al and psychological coping methods, and one or more stress relief techniques.[18] In this study, coping strategies ranged from talking to families online, watching TV, social media activities, and eating. The need to continue to be connected with others seems to be a key coping strategy among Filipino emergency physicians. During their tour of duty, EM physicians may not have safe access to meals owing to the use of barrier PPE's or fear of breaking infection control procedures. Eating was a source of happiness and a good way of coping. When constantly under stress, the adrenals produce more cortisol leading to increased appetite and motivation for food. Highly palatable and calorie-dense food causes the body to release hormones that suppress stress signals and emotions.[19] Another factor that makes eating during stress feel good is dopamine. It is released when we do activities that we deem as "good" or something that contributes to one's survival.

Post-traumatic stress involves oxidative stress and brain chemical abnormalities, which can be improved through good nutrition. A study by looked at the association between fruit and vegetable consumption and psychological distress in adults over the age of 45 years old and concluded that increased fruit and vegetable consumption helped reduce psychological distress in this middle-aged population.[20]

Glucose allows us to make rational decisions, regulate mood, and manage our emotions. Reduced amounts may make symptoms of post-traumatic stress worsen. Maintaining stable glucose levels is only one part of managing and treating PTS symptoms. Nutrition directly impacts both physical and mental health.[21] An adequate supply of food to ER physicians during the pandemic may reduce symptoms of post-traumatic stress.

In summary, the presence of symptoms of post-traumatic stress was identified among EM physicians directly handling covid-19 patients in the Philippines. About 21% of respondents had IES-R scores 24 to 32 wherein PTSD is a clinical concern and 16% had scored 33 to 38, the best cutoff for a probable diagnosis of PTSD. There were multiple coping strategies identified, but the availability of free food was noted to have a significant effect in reducing the risk factors of PTSD by 76%. Protecting the mental health of EM physicians is an important component of public health measures for addressing the COVID-19 epidemic as outlined by ethical frameworks identified during the H1N1 pandemic. [22] Interventions to promote mental well-being among EM physicians and residents need to be immediately implemented.

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