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Relationship between sedation, delirium, and post-traumatic stress disorder among mechanically ventilated patients

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Abstract---Background: Delirium is a significant medical condition that is common among patients in intensive care units. Beyond the increased risk of mortality, patients who experience an episode of delirium often go on to develop long-term psychiatric disturbance, including symptoms of post-traumatic stress disorder (PTSD). Aim: To investigate the relationship between sedation, delirium and post-traumatic stress disorder among mechanically ventilated patients. Design: A descriptive correlational research design was utilized in this study. Setting: The study was carried out at different intensive care units at Cairo university hospitals with different specialties. Sample: A purposive sample of 110 patients was included in the study over a period of three months. Tools: Four tools were used; Patient's Demographic and Medical Data Sheet, Richmond Agitation Sedation Scale (RASS), The Intensive Care Delirium Screening Checklist (ICDSC) and Post-Traumatic Stress Disorder (PTSD) Checklist for DSM-5 (PCL-5). Results: About (74.5%) of the studied sample had PTSD. There was negative statistical significant correlation between sedation and post-traumatic stress disorder. There was positive statistical significant correlation between delirium and post-traumatic stress disorder. There was no statistical significant correlation between delirium and sedation. Conclusion: This study provides a complex picture of the relationship between delirium, sedation and PTSD. Majority of studied sample had significant symptoms of PTSD. Recommendations: The incidence of delirium and PTSD among

mechanically ventilated sedated patients should be assessed as a routine in ICUs and future longitudinal studies will clarify the course of PTSD after ICU discharge.

Keywords---Sedation, delirium, post-traumatic stress disorder, mechanically ventilated patients.

1 Introduction

Delirium associated with critical illness develops in the intensive care unit (ICU) in the presence of severe co-morbidities, multiple organ failure, and intrusive treatment techniques such as mechanical ventilation, sedation, and lack of sleep. Delirium is described by an acute confessional condition that includes changing mental status, inattention, and disordered thinking or an altered consciousness (Bulic et al., 2017). Psychomotor activity can be used to distinguish between delirium subtypes. Patients were categorized as having "no delirium" if they had no symptoms, "clinical delirium" if they did and "subsyndromal delirium," which has been associated with post-ICU outcomes (Brummel et al., 2017).

The term "psychotic disorders" refers to a group of severe mental illnesses that cause a loss of reality awareness, including hallucinations, delusions, and perceptual distortions. Prior to being given a diagnosis of a psychotic condition, patients must go through a complete medical evaluation to ensure that medical conditions are not the underlying cause of the symptoms. Patients who look to be psychotic are routinely misdiagnosed as being agitated and sent straight to mental health services. However, delirium, a state of mental confusion that can resemble a psychotic disease but is actually caused by a potentially hazardous medical condition, is frequently present in these patients. To reduce their "agitation," delirious patients are frequently given high dosages of haloperidol intravenously, and they frequently receive no medical attention at all. Sadly, this misdiagnosis and poor managing can result in mortality (Partners in Health, 2015).

Post-traumatic stress disorder (PTSD), depression, and anxiety are important mental health problems following a serious illness (Denke et al., 2018). Anyone who has experienced or witnessed a terrible incident, such as surviving a serious illness, is susceptible to developing post-traumatic stress disorder (PTSD), a significant mental health condition. Additionally, those with a history of depression and other related diseases may be more prone to developing PTSD (Patel et al., 2016). The emotional, psychological, sociological, and physical effects of depression can lead to diminished coping skills.

PTSD symptoms are more common in ICU patients who are either fully awake or heavily sedated all the time, and less common in patients who experience intermediate or fluctuating levels of awareness (Rock, 2014). This brings attention to the role that sedation plays in the development of post-delirium PTSD. Although the findings are conflicting and non-confirmatory, ICU sedation type and duration have been studied in relation to the risk of post-ICU PTSD. Much emphasis has been paid to how benzodiazepines work. Post-ICU PTSD has been

associated with the use of opioids, lorazepam, and midazolam. On the other hand, one of the largest, most complete, and most current ICU-related PTSD studies found no association between PTSD and the length of delirium, the dose of benzodiazepines, or the dose of opiates (Patel et al., 2016). These are modifiable risk factors that should be taken into account, especially by ICU staff, however there is no direct link between the analgesic and sedative classes and PTSD in the ICU (Marra, Pandharipande & Patel, 2017).

Significance of the study

The true prevalence and magnitude of delirium has been poorly documented because a myriad of terms, such as acute confusional state, ICU psychosis, acute brain dysfunction, and encephalopathy, have been used historically to describe this condition. Delirium occurs in up to 60% to 80% of mechanically ventilated medical and surgical ICU patients and 50% to 70% of non-ventilated medical ICU patients and should be considered as a significant, serious problem and treated as a possible contributor to mortality risk increased length of mechanical ventilation, longer ICU stays, increased cost, prolonged neuropsychological dysfunction, and mortality (Marra et al., 2017).

A serious medical disorder that frequently affects hospitalized patients is delirium. Patients who encounter delirium episodes frequently acquire long-term psychological disruption, including signs of post-traumatic stress disorder, in addition to an elevated risk of mortality. Although there is a rising interest in comprehending the intricate connection between delirium and PTSD, there is little coherence in the literature that is currently available. Hence, in this study, we aim to develop a unified and comprehensive description of the cognitive and psychiatric basis for post-delirium PTSD in order to promote awareness of this condition, improve patient care and spark further investigation.

To the best of our knowledge, there is no data regarding delirium among mechanically ventilated patients in Egyptian intensive care units. We investigated the incidence of PTSD and examine its relation with delirium and sedation in this population

Aim of the study

The aim of the current study is to investigate the relationship between sedation, delirium and post-traumatic stress disorder among mechanically ventilated patients.

Research Questions

To fulfill the aim the study the following research questions is formulated:

Q1- What is the incidence of post-traumatic stress disorder among sedated delirious mechanically ventilated patients?

Q2- What is the relationship between sedation, delirium and post-traumatic stress disorder among mechanically ventilated patients?

2 Materials and Methods

Research design

A descriptive correlational research design was utilized in this study.

Sample

A purposive sample of 110 patients who met the inclusion criteria was included in the current study over a period of three months from August to October 2022. Inclusion criteria: Patients after 48 hr. from ICU admission, mechanically ventilated, under sedation for one week and stayed in the ICU for two weeks were included. Exclusion criteria: Patients who are less than 18 years old, and who have had brain injury or psychiatric disorder.

Setting

The study was carried out at the different intensive care units at Cairo university hospitals with different specialties (medical, surgical, burn, emergency and neurological ICUs; each one contains around 10-15 ICU beds, received patients with different diagnoses. The nurse: patient ratio is 1:1 and 1:2.

Tools of Data Collection

Four tools were utilized to collect data pertinent to the current study as follows:

1-Patient's Demographic and Medical Data Sheet

It was developed by the researchers; it contains data related to patients such as (gender, age, level of education, marital status, the main reason for ICU admission, length of stay in the ICU, number of days on mechanical ventilation, mood of mechanical ventilation, used sedative drugs, use of restraint.

2-Richmond Agitation Sedation Scale (RASS)

The Richmond Agitation Sedation Scale (RASS) is a tool created to measure a patient's level of alertness and agitated behavior, which contains a 10-point scale with a range from -5 to +4. Stages -1 to -5 indicate five levels of drowsiness, from "awakens to voice" to "unarousable," whereas Levels +1 to +4 depict rising agitation levels. Anxiety and trepidation mark the lowest degree of agitation, which then reaches a violent and confrontational apex. "Alert and tranquil" is the RASS level 0. Within a week, while the patient was under sedation, the researchers measured RASS once daily. Strong inter-rater reliability ($\kappa = 0.64-0.82$, $r = 0.922-0.983$) (Sessler et al., 2002). Excellent criteria, concept, face, and content validity were all shown by the RASS.

3-The Intensive Care Delirium Screening Checklist (ICDSC)

It was developed by Bergeron et al. (2001). It assesses occurrence of delirium symptoms. It is an eight-item list of delirium symptoms that has been put through a 24-hour evaluation. Level of consciousness, inattention, disorientation, hallucinations, delusions, or psychosis; psychomotor agitation or retardation; inappropriate speech or mood; disruptions of sleep/wake cycles; and symptom variation are the eight symptoms. Each item of the rating scale (yes/no) was credited one point, for a maximum total score of eight. Patients are given one

point for each symptom that reveals during the specified time frame (zero points if symptom did not manifest). A score 0 indicates normal, 1-3 is Subsyndromal Delirium, score ≥ 4 indicates a positive ICDSC and the presence of delirium. The sensitivity (which raises awareness about transient clinical features necessary to make a diagnosis for delirium) is 99% and specificity is 64% (reflect false positive scoring on the checklist because patient with psychiatric diagnosis). The Arabic ICDSC showed acceptable internal consistency (Cronbach $\alpha = 0.63$ and composite reliability = 0.64).

4-Post-Traumatic Stress Disorder (PTSD) Checklist for DSM-5 (PCL-5)

The National Center for PTSD created the PCL-5 (2013). It shows how troubled respondents had been by that specific symptom in the week following their delirium recovery. The DSM-5 criteria are closely followed by this 20-item checklist of PTSD symptoms (Weathers et al., 2013). The researchers translated it into the Arabic language by using the back translation technique; the reliability was 0.80, which is considered to be acceptable. Five nursing professors assessed the content validity and made some minor modifications. It consists of four subscales; re-experiencing (items 1-5), avoidance (items 6-7), negative alteration in cognition and mood (items 8-14) and hyper-arousal (items 15-20). Each item was scored from 0 (not at all) to 4 (extremely). A total score for symptom severity is (range 0-80). A higher score indicates a more serious problem. PCL-5 cutoff score between 31-33 is indicative of probable PTSD.

Procedure

The current study was carried out through two phases: preparation, and implementation.

1- Preparation phase:

Conduction of the current study started with an extensive literature review, selection and preparation of the data collection tools a review of related literature covering various aspects of the problem was carried out, using available books, journals, and internet to get acquainted with the research problem. Official approval was granted from the Scientific Research Ethics Committee to proceed with the study then obtaining the managerial agreements to carry out the study.

2-Implementation phase:

Once official permissions were granted, the actual implementation of the study was started. The researchers visited the selected ICU on daily basis to enroll patients who meet the inclusion criteria. The purpose of the study was explained to relatives of the delirious patient and take their consent first, then from the patient when they become alert to participate in the current study. The researchers started with collecting data about the demographic and medical data sheet by using tool 1. Then the level of alertness and agitated behavior was assessed using a sedation scale (RASS) (tool 2) which was recorded once daily for one week as the patient received the sedation, the assessment of delirium was done by utilizing intensive care delirium screening checklist (ICDSC) (tool 3), at the time of sedation turned off for two hours which called as "sedation vacation", once daily for one week during the ICU stay, most of the time it was assessed at the morning shift. After one week from extubation from mechanical ventilation

and stopping the sedation. Regarding the assessment of post-traumatic stress disorder (PTSD) was done using (PCL-5) checklist (tool 4) at the selected ICU through interviewing the patient which lasted about 15-20 min. Finally, the researchers thanked the participants for their cooperation and voluntary participation.

Pilot Study

A Pilot study was carried out on 10% of the sample consisted of 10 mechanically ventilated patients to ensure the clarity and applicability of the study measures and the feasibility of the research process. The pilot study revealed that, no modifications are needed to be made. Subject who shared in the pilot were included in the main study sample.

Ethical Considerations

The Scientific Research Ethical Committee, Faculty of Nursing, Cairo University granted preliminary clearance with the following conditions: (IRP Approval Number: 2019041701). The hospital manager provided official approval for the study to move forward. Each patient was informed that participation in the trial was completely voluntary and that he had the freedom to withdraw at any moment. The study was explained orally to the patient's relatives first, and then to them once they were alert. To participate in the current study, written consent was first sought from the family members of delirious patients, and then, once the patient became alert, from the patient themselves. Through the coding of all data, the confidentiality and anonymity of each patient were guaranteed.

Statistical Analysis

Data entry and statistical analysis were done using SPSS 25 statistical software package. Data was presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations. ANOVA and T- Test were used for compares the difference between two means in relation to the variation in the data, pearson correlation test was used.

3 Results and Discussion

Table (1) shows that more than two thirds (66.4%) of the studied sample were females, with a mean age of 40.7 ± 12.7 , more than half (56.4%) of them were married. Regarding the level of education, more than one third (40%) of them had secondary education. The majority (79.1%) of the studied sample were smokers.

Table (2) clarifies that majority (86.4%) of the studied sample stayed in the ICU for two weeks, as regards to sedation drugs, fentanyl, midazolam, and propofol were in percentages of 50%, 28.2%, 21.8% respectively. Regarding the patient outcome, the majority (90%) of the studied sample recovered. Respiratory disorders, cardiovascular disorders and hysterectomy were the most frequent medical diagnoses among the studied sample in percentages of 23.6%, 14.5%, 13.6% respectively, more than one third (44.5%) of them were connected to mechanical

ventilation for 3 days, and the majority (70.9%) of them were on SIMV mode for the mechanical ventilation.

Table (3) reveals that around one third (29.1%) of the studied sample were lightly sedated at day 1 and (16.4%) were agitated while 15.5% were drowsy while (30%) were lightly sedated at day 2 and 18.2% were drowsy but 14.5% agitated. However, at day 3 there were (35.8%) drowsy and (21.1%) were lightly sedated while at day 4 there was (37%) lightly sedated.

Table (4) represents that the percent of subsyndromal delirium decreased from (68.9%) at day 1 to (47.1%) at day 5 while the percent of delirium increased from (31.1%) at day 1 to (52.9%) at day 5 for the studied sample.

Fig 1 indicates that the majority of the studied sample (74.5%) had PTSD, while 25.5% hadn't.

Table (5) reveals that the highest mean of the studied sample was (13.37±4.51) for negative alterations in cognition and mood.

Table (6) shows that there was negative statistical significant correlation between sedation and post-traumatic stress disorder. There was positive statistical significant correlation between delirium and post-traumatic stress disorder.

Table (7) clarifies that there was no statistical significant correlation between delirium and sedation.

Table (8) shows that there was a statistical significant correlation between delirium and both age and medical diagnosis. There was a statistical significant correlation between sedation and numbers of mechanical ventilation. There was a statistical significant correlation between PTSD and medical diagnosis.

Table (1): Frequency Distribution of Demographic Data among Studied Sample (N=110)

Variables	No.	%	Variables	No.	%
Age			Occupation		
20-29	21	19.1	Employee	33	30.0
30-39	40	36.4	Worker	17	15.5
40-49	23	20.9	Housewife	54	49.1
50-59	13	11.8	Retired	2	1.8
60-69	13	11.8	Not Working	4	3.6
M ± SD 40.7 ± 12.7					
Gender			Smoking		
Male	37	33.6	No	87	79.1
Female	73	66.4	Yes	23	20.9
Marital Status			Education		
Single	30	27.3	Illiterate	28	25.5
Married	62	56.4	Preparatory	11	10.0
Divorced	11	10.0	Secondary	44	40.0
Widow	7	6.4	University	27	24.5

Table (2): Frequency Distribution of Medical Data among the Studied Sample (N=110)

Medical Data	No.	%	Medical Data	No.	%
Length of Stay			Diagnosis		
Two weeks	95	86.4	Burn	14	12.7
Three weeks	15	13.6	Hysterectomy	15	13.6
Sedation Drugs			Preclampsia	11	10.0
Fentanyl	55	50.0	Respiratory Disorders	26	23.6
Midazolam	31	28.2	Shock	14	12.7
Propofol	24	21.8	DKA	5	4.5
Restrain			Cardiovascular Disorders	16	14.5
No	74	67.3	Renal Disorders	9	8.2
Yes	36	32.7	Comorbidities		
Patient Outcome			None	62	56.4
Recovery	99	90	HTN	19	17.3
Death	11	10.0	DM	29	26.4
Mode of Mechanical ventilation			Days of Mechanical ventilation		
SIMV	78	70.9	3	49	44.5
CMV	13	11.8	4	39	35.5
PCV/AC	8	7.3	5	13	11.8
VCV	11	10.0	>5	9	8.2

Table (3): Frequency Distribution of Level of Alertness and Agitated Behavior among the Studied Sample

Score	Term	Day 1 N=110		Day 2 N=110		Day 3 N=109		Day 4 N=54	
		No.	%	No.	%	No.	%	No.	%
-5	Unarousable	1	.9	1	.9	1	0.9	1	1.9
-4	Deep Sedation	5	4.5	2	1.8	0	0.0	1	1.9
-3	Moderate Sedation	21	19.1	23	20.9	8	7.3	12	22.2
-2	Light Sedation	32	29.1	33	30.0	23	21.1	20	37.0
-1	Drowsy	17	15.5	20	18.2	39	35.8	10	18.5
0	Alert And Calm	5	4.5	2	1.8	14	12.8	8	14.8
+1	Restless	5	4.5	7	6.4	16	14.7	2	3.7
+2	Agitated	18	16.4	16	14.5	6	5.5	1	1.9
+3	Very Agitated	6	5.5	6	5.5	1	0.9	0	0.0
+4	Combative	0	0.0	0	0.0	1	0.9	0	0.0

Table (4): Frequency Distribution of Delirium Classification among the Studied Sample

Delirium	N	Normal		Subsyndromal Delirium		Delirium	
		No.	%	No.	%	No.	%
Day 1	103	0	0.0	71	68.9	32	31.1
Day 2	102	0	0.0	66	64.7	36	35.3
Day 3	101	1	1.0	57	56.4	43	42.6
Day 4	57	2	3.5	32	56.1	23	40.4
Day 5	17	0	0.0	8	47.1	9	52.9
Day 6	3	0	0.0	2	66.7	1	33.3
Day 7	3	0	0.0	1	33.3	2	66.7

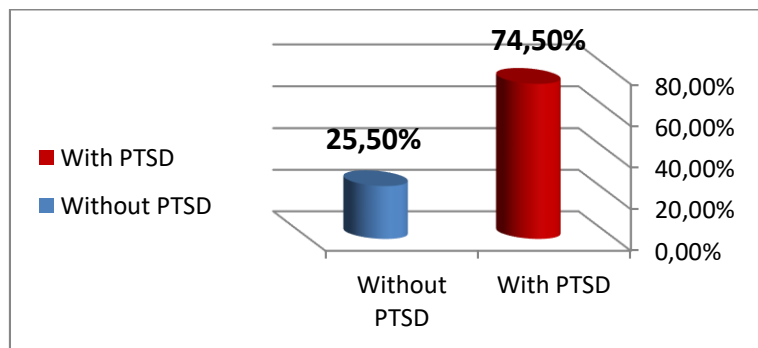


Fig 1. Frequency distribution of PTSD among the studied sample (N=99).

Table (5): Frequency Distribution of PTSD Subscales among the Studied Sample (N=99)

*PTSD Subscales	Mean	SD
Re-experiencing (items 1-5 – max score = 20)	9.32	3.53
Avoidance (items 6-7 – max score = 8)	3.78	2.01
Negative alterations in cognition and mood (items 8-14 – max score = 28)	13.37	4.51
Hyper-arousal (items 15-20 – max score = 24)	9.34	2.91
Total	37.24	10.34

*Dropout of patient because of death.

Table (6): Correlation between PTSD and both of Sedation and delirium

Variables		Sedation	Delirium
PTSD	r	-0.21	0.26
	p	0.03*	0.009*

*Significant at p-value<0.05

Table (7): Correlation between Sedation and Delirium

Sedation	Delirium	
	r	p
Day 1	0.03	0.71
Day 2	0.14	0.15
Day 3	0.09	0.33
Day 4	0.01	0.9
Day 5	0.04	0.87

Table (8): Correlation between Sedation, Delirium, PTSD and Selected Variables

Variables	Delirium		Sedation		PTSD	
	r	p	r	p	r	p
Age	0.22	0.02*	0.05	0.57	0.06	0.52
Education	-0.03	0.7	-0.06	0.52	-0.05	0.58
Gender	T=1.7	0.08	T=0.3	0.69	T=0.65	0.51
Number of days on MV	0.04	0.65	0.19	0.04*	0.02	0.81
Medical diagnosis	F=1.620	.043*	F=1.4	0.09	F=2.05	0.006*
Restrain	T=-0.86	0.39	T=1.4	0.15	T=0.55	0.58
Comorbidities	F=1.6	.11	F=.79	0.59	F=.69	0.69

*Significant at p-value<0.05 T: t value of the t test

Discussion

Regarding socio-demographic characteristics, the findings of the current study illustrated that, more than two-thirds of the studied sample were females, with a mean age of (40.7 ± 12.7), and more than one-third of them had secondary education, these findings are contradicted with Arthur et al. (2015) who studied the incidence and risk factors for delirium among mechanically ventilated patients in an African intensive care, and mentioned that there were 160 eligible participants assessed for delirium. The mean age was 36.6 years; the majority was male and had some level of education. The finding of the current study indicated that there is a significant correlation between age and delirium, this finding is contradicted with Denek et al. (2018) who found that, no association between the duration of delirium and age.

Regarding delirium, the findings of the current study revealed that, the percentage of delirium increased from day 1 to day 5 for the studied sample, These findings were in accordance with Svenningsen (2013) who founded that, of the remaining 640 patients, 65% were delirious on 1 or more days, in this regards According to research, delirium is linked to higher mortality rates, longer hospital stays, and use of mechanical ventilation (Junior, Kumar, Kumar & Gupta, 2022).

Regarding the level of alertness and agitated behavior the current study showed that around one third of the studied sample were lightly sedated at day 1, these findings are supported by Yahya et al. (2013) who founded that a significantly higher proportion of patients was lightly sedated on days 1, 2, and 3 and more Richmond Agitation Sedation Scale assessments between (-2 and 1), in the first

48 hours in the early goal-directed sedation versus standard sedation, respectively.

Regards to sedation drugs, in the current study fentanyl, midazolam, and propofol are administered, this finding is contradicted with Yahya et al. (2013) indicated that, early goal-directed sedation patients received midazolam on 6 of 173 (3.5%) versus 4 of 114 (3.5%) standard sedation patient-days when dexmedetomidine was given. Propofol was given to 16 of 21 (76%) of early goal-directed sedation versus 16 of 16 (100%) of standard sedation patients ($p = 0.04$). Early goal-directed sedation patients had 101 of 175 (58%) versus 54 of 114 (47%; $p = 0.27$) delirium-free days and required significantly less physical restraints 1 (5%) versus 5 (31%; $p = 0.03$) than standard sedation patients.

Regarding the relationship between delirium and sedation, the current study showed that, there is no statistical significant correlation. This finding is in agreement with Schulingkamp Woo, Nguyen, Sich and Shadis (2016). However, these findings were not confirmed by Bulic Bennett and Georgousopoulou (2021) and Rasheed et al. (2019) who stated that of the 342 patients who were eligible for delirium assessment, the frequency of delirium in the ICU was 17.3%. Data analysis revealed a strong statistically significant correlation between delirium and sedation.

Regarding PTSD, the findings of the current study revealed that the majority of the studied sample had PTSD; these findings were in the same vein with Patel et al. (2016). While, these results are contradicting with Hatch et al. (2018) who found less than third of participants had PTSD. It has been suggested that the quality of cognitive processing at the time of the traumatic event is important in the development of PTSD. Those individuals who report feeling confusion and feeling overwhelmed as they experienced the traumatic situation are more likely to suffer from PTSD. ICU patients may be predisposed to PTSD because during the traumatic event, either due to the treatment(s) instituted during the ICU stay or due to the critical illness. Ultimately, their ability to process information is likely to be compromised (Marra et al., 2017).

Concerning the relationship between PTSD and delirium, the current study revealed that there is a statistically significant correlation. This supported previous studies that identified postoperative delirium as a risk factor for acute PTSD, current result in accordance with Bulic et al. (2021), Denke et al. (2018) and Langan et al. (2017), this finding is not supported by Girard et al. (2017) and Wolters et al. (2016) who documented that no significant correlation between PTSD symptoms and duration of delirium.

This may be explained by the cognitive model of Ehlers and Clark (2000) who postulated that PTSD is characterized by a disturbance of autobiographical memory that manifests as poor elaboration and inadequate integration into autobiographical memories. Delirium is associated with fragmental memories or delusions and therefore seems to affect episodic memory. Consequently, delirium might inhibit encoding of factual ICU events and decrease impairment of autobiographic memory, which is associated with PTSD symptoms. In addition, a high level of fear during a traumatic event is a relevant factor in the etiology of

PTSD and leads to a fear network. Acute ICU stress and ICU mood were associated with delirious symptoms such as nightmares, agitation, and hallucination.

Furthermore, the findings of the current study represents that none of the demographic or clinical factors were associated with development of PTSD except medical diagnosis (cardiovascular and renal disorders). These findings are consistent with Grover, Sahoo, Chakrabarti and Avasthi (2019). From researcher point of view, demographic data interactions could be due to chance and should look forward to replication.

Another relevant finding of our study was the relationship between PTSD and sedation, the results of the current study represented that there was a negative statistical significant correlation. The result has been conflicting and non-confirmatory by Marra, et al. (2017). Attention has been focused on the type and duration of ICU sedation, as it relates to risk of post-ICU PTSD, despite these being modifiable risk factors, especially for ICU providers to consider. The impact of sedation interruption or minimizing sedation on post-ICU PTSD risk remains unclear, but potential benefits of minimizing sedation seem to outweigh the potential harm. Protocol-driven sedation interruptions may actually reduce PTSD symptoms after ICU care, despite old-standing beliefs stating otherwise (Girard et al., 2017).

Strengths and limitations of the study

The current study included participants from a variety of ICU disciplines and used a number of standardized assessment instruments. Based on the data gathered, it will be feasible to facilitate a network of discussions, actions, programmes, and healthcare policies to help the intra-hospital team comprehend the emotional and behavioral effects triggered by severe sickness and the intensive care setting. Due to the lack of follow-up following hospital discharge, it is difficult to determine the prevalence of PTSD in ICU patients. The study's sample size was modest and constrained by the patients' preexisting significant physical disabilities, the survival rate, and the challenges of participation.

4 Conclusion

Taken together, this study provides a complex picture of the relationship between delirium, sedation and PTSD. Majority of studied sample had significant symptoms of PTSD. There was negative statistical significant correlation between sedation and post-traumatic stress disorder. There was positive statistical significant correlation between delirium and post-traumatic stress disorder. There was no statistical significant correlation between delirium and sedation.

5 Recommendations

Based upon the findings of the current study, the following are recommended: the incidence of delirium and PTSD among mechanically ventilated sedated patients should be assessed as a routine in ICUs, replication of the study on larger

samples at different geographical locations for data generalization and future longitudinal studies will clarify the course of PTSD after ICU discharge.

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