

# Assessment of Emotional Dysregulation and Sleep Quality in Recovered COVID-19 Patients in Haryana

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**Abstract:** ***Introduction:** The COVID-19 outbreak and subsequent lockdown have created widespread concern, and literatures describe the side effects on mental health and sleep quality. **Aim:** The aim of the study was to explore emotional dysregulation and sleep quality following COVID-19 recovery in people who attended the psychiatry outpatient department services, Haryana. **Methods:** It was a cross-sectional study, and patients who had contracted COVID-19 infection and recovered were enrolled (n=74). These were all selected based on the inclusion criteria of COVID-19 infection with hospitalization or non-hospitalization and presence at a post-recovery psychiatry OPD, and were assessed and analyzed descriptively on self-report questionnaires, i. e., Difficulties in Emotional Regulation Scale (DERS) and Pittsburgh Sleep Quality Index (PSQI). **Results:** The majority of participants (83%) were between the ages of 36 and 55, married (94%) and had completed at least matric (55%). 14% of the patients had a history of chronic illness (types unknown), and 52% were hospitalized due to COVID-19 infection. Results revealed clear disturbance on emotional regulation and sleep quality. A total high mean score (standard deviation) on DERS scale 99.91 (19.94) indicated higher level of emotional dysregulation. Similarly, global PSQI mean score of 10.49 (1.50) also indicated significantly disturb functioning of sleep, as score more than 5 indicate disturbance. Differences in emotional regulation and sleep quality between hospitalized and non-hospitalized were seen. Present findings highlight the importance of extensive assessment of sleep quality and emotional regulation in post COVID-19 recovered patients.*

**Keywords:** COVID-19, emotional dysregulation, sleep quality, post recovery, mental health.

## 1. Introduction

Despite recent medical advances, coronavirus disease 2019 (COVID-19) has claimed the lives of almost 1 million people in less than a year (Holshue et al., 2020; WHO, 2020). Aside from the mortality, the pandemic has caused enormous emotional, physical, and economic issues worldwide. The emerging literature examines the impacts of numerous traumatic stressors related to COVID-19, as well as the effects of less severe types of stress exposures. COVID-19 has already led to diverse mental health problems, including anxiety, depression, posttraumatic stress disorder, and other trauma-and stress-related disorders (Grover et al., 2020; Bhat et al., 2020).

Only a few studies of mental health problems among patients hospitalized with COVID-19 have been published. A significant incidence of PTSS (96.2%) was found in a study of hospitalized but stable patients (Bo et al., 2020). Psychiatric inpatients in China showed greater PTSD, anxiety, and depression symptoms, as well as more aggression, impulsivity, and health concerns, as compared to a control sample. They also had more severe suicide thoughts (Xiang et al., 2020).

Emotion dysregulation is characterized by inability to understand and accept emotional experiences, alter their intensity or duration, and manage emotional reactions appropriately and avoid maladaptive behaviours such as impulsive acts. Psychological distress has been linked to emotional dysregulation (Laghi et al., 2020; Preti et al., 2013; Tellez-Monnelly et al., 2021). People are categorized

as high, medium, or low-risk for developing psychological symptoms, particularly anxiety and depression, depending on their coping capacities, and a range of psychological difficulties and personal traits may affect the ultimate development of psychological disorders. Patients with COVID-19 may have these symptoms while in the hospital, but anxiety and emotional dysregulation may remain after they have recovered.

Sleep and stress have been shown to a bidirectional relationship across the life span with stressors affecting sleep quality and vice versa (Lo Martire et al., 2020). Jaharmi et al. (2021) stated that sleep disturbance is quite prevalent in patients who had contracted COVID-19. Insomnia and poor sleep quality in COVID-19 patients might be caused by physical pain or side effects of medications used to treat the virus (Shi et al., 2020).

Previous study on the effects of endemics has shown that they have a long-term impact on one's psychological wellbeing, and current data on COVID-19 is also well absorbed by researchers on psychological wellbeing, implying that additional research on post COVID-19 related issues patients is needed. Keeping this in mind, present study was designed to investigate the sleep quality and emotional dysregulation in individuals who were either treated at home or admitted to a hospital for COVID-19 treatment.

## 2. Method

Volume 13 Issue 1, January 2024

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

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**Aim**

The aim of the study was to explore emotional dysregulation and sleep quality following COVID-19 recovery in people who attended a psychiatry clinic in Haryana.

**Participants and procedure:**

It was a cross-sectional study, and patients who had contracted COVID-19 infection and recovered were enrolled. These were all selected based on the inclusion criteria of COVID-19 exposure with hospitalization or non-hospitalization and presence at a post-recovery psychiatry OPD. Patients were invited to complete self-report questionnaires, i. e., Difficulties in Emotional Regulation Scale (DERS), Pittsburgh Sleep Quality Index (PSQI), as well as provide socio-demographic information. They all volunteered, and those who were unable to provide informed consent were excluded from the study. They all were presented with negative test report and were afebrile to touch.

**Tools****Sociodemographic information:**

An initial questionnaire was administered to assess socio-demographic characteristics, such as gender, age, education, occupation and marital status. Following that, a question on COVID-19 infection history and treatment was asked.

**Emotional dysregulation:**

For assessment of emotional dysregulation, a 36-items self-report questionnaire, Difficulties in Emotional Regulation Scale (DERS) (Gratz and Roemer, 2004) was taken. Participants are required to rate each item on a 5-point Likert type scale (1=almost never; 2=sometimes; 3=about half the time; 4=most of the time; and 5=almost always). It has six dimensions, namely non-acceptance of emotional responses (NONACCEPT), difficulty engaging in goal-directed behavior (GOALS), impulse control difficulties (IMPULSE), lack of emotional awareness (AWARENESS); limited access to emotion regulation strategies (STRATEGIES), and lack of emotional clarity (CLARITY). The total score is calculated by adding all of the items. The higher the score, the more difficult it is to regulate emotions.

**Sleep measures:**

The Pittsburgh Sleep Quality Index (PSQI) (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) was used to assess sleep quality. The PSQI is a well-known self-report questionnaire, and it has 19 items, from which partial scores in seven subscales (ranging from 0 to 3) and a global score (ranging from 0 to 21) computed from them. Subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction are the subscales. Poor sleep quality is indicated by a PSQI global score of >5.

**Data analysis:**

Data analysis was done using the Statistical Package for the Social Sciences (SPSS; version 23; IBM SPSS). The demographics of the patients were derived using frequency and percentages. The mean and standard deviation were used to present numerical data. A comparison of the variables was made for hospitalized and non-hospitalized of

COVID-19 infection considering sleep quality as factor, using one-way ANOVA.

**3. Results****Socio-demographic:**

This study included a total of 74 patients. The majority (83%) were between the ages of 36 and 55, married (94%), had completed at least matric (55%), and 39% were self-employed. 14% of the patients had a history of chronic illness (types unknown), and 52 were hospitalized owing to COVID-19 infection (Table 1).

**Table 1:** Descriptive characteristics of the sample (N=74)

		Frequency (%)
Gender	Male	41 (55.40)
	Female	33 (44.60)
Age (in years)	20-30	12 (16.21)
	31-40	23 (31.08)
	41-50	29 (39.18)
	Above 50	10 (13.51)
Family Type	Joint	23 (31.08)
	Nuclear	51 (68.91)
Religion	Hindu	66 (89.18)
	Sikh	8 (10.81)
Marital Status	Single	4 (5.40)
	Married	70 (94.60)
Education	Matric	41 (55.40)
	Graduate	23 (31.08)
	Postgraduate	9 (12.16)
	Doctorate	1 (1.35)
Occupation	Student	3 (4.05)
	Govt. job	16 (21.62)
	Self-employed	29 (39.18)
	Housewife	26 (35.13)
Income (per month)	10, 000 – 20, 999	10 (13.51)
	21, 000 – 30, 999	11 (14.86)
	31, 000 – 40, 999	11 (14.86)
	41, 000 – 50, 999	7 (9.45)
	Above 51, 000	6 (8.10)
	Not disclosed	29 (39.18)
History of chronic disease	Yes	11 (14.86)
	No	63 (85.13)
Hospitalized due to COVID-19	Yes	39 (52.70)
	No	35 (47.29)

Overall, participants who were infected with COVID-19 and were either hospitalized or managed at home isolation had poor sleep quality and emotional dysregulation.

**Emotional dysregulation:**

DERS scale was used to record response regarding their emotional variation due to contract of COVID-19. Overall, on non-acceptance of emotional responses, participants had mean and SD of  $18.08 \pm 7.26$ , difficulties in goal-directed behaviour ( $16.8 \pm 4.64$ ), Impulse behaviour ( $16.55 \pm 5.23$ ), on limited access to emotion regulation strategies ( $19.32 \pm 6.59$ ), lack of emotional awareness ( $16.41 \pm 4.65$ ), and lack of clarity had score of mean  $\pm$  SD  $12.70 \pm 7.38$ . The mean scores on each subscale of DERS indicated higher value which means participants had higher level of emotional dysregulation, as well as the overall total score ( $99.91 \pm 19.94$ ) was also higher, indicating that, a score of more than 50 indicated a higher level of emotional dysregulation. Further, a non-significant difference in emotion regulation

between hospitalized and non-hospitalized individuals, with the hospitalized group scoring higher on goals (Hospitalized 17.41±5.06 vs. Non-hospitalized 16.20±4.11), and impulse (Hospitalized 17.00±5.20 vs. Non-hospitalized 16.06±5.29)

were seen. The total score of hospitalized (99.72±17.57) was also less compare to who were managing at home (100.11±22.55) (Table 2).

**Table 2:** Mean (SD) scores for the non-hospitalized and hospitalized COVID-19 patients on DERS and PSQI variables

		Non-Hospitalized (n = 35) Mean (SD)	Hospitalized (n = 39) Mean (SD)	Total (n = 74) Mean (SD)
Non Acceptance	Emotional Dysregulation	18.17 (7.42)	18.00 (7.14)	18.08 (7.23)
Goals		16.20 (4.11)	17.41 (5.07)	16.84 (4.64)
Impulse		16.06 (5.30)	17.00 (5.21)	16.55 (5.24)
Awareness		16.17 (4.86)	16.62 (4.52)	16.41 (4.66)
Strategies		19.29 (6.51)	19.36 (6.75)	19.32 (6.60)
Clarity		14.23 (10.24)	11.33 (3.30)	12.70 (7.39)
Total Emotional Dysregulation		100.11 (22.56)	99.72 (17.57)	99.91 (19.95)
Subjective Sleep	PSQI	2.80 (0.41)	2.74 (0.44)	2.77 (0.42)
Sleep Latency		3.00 (0.00)	2.97 (0.16)	2.99 (0.12)
Sleep Duration		0.66 (0.59)	0.51 (0.50)	0.58 (0.55)
Sleep Efficacy		1.14 (0.81)	0.85 (0.71)	0.99 (0.77)
Sleep Disturbance		2.63 (0.49)	2.72 (0.46)	2.68 (0.47)
Sleep With Medication		0.69 (1.05)	0.31 (0.57)	0.49 (0.85)
Total Sleep Dysfunction		2.91 (0.37)	2.90 (0.37)	2.91 (0.33)
Global Score PSQI			10.91 (1.84)	10.10 (0.99)

**Sleep quality:**

Sleep quality was assessed by the PSQI. Overall poor sleep quality was observed among participants irrespective of their hospital admission or non-hospitalization due to COVID-19 infection (Mean= 10.49; SD= 1.50). Further, participants who hospitalized due to COVID-19 had scored less (Mean= 10.10; SD=.99) than who hospitalized due to COVID-19 (Mean= 10.91; SD= 1.83). The COVID-19 infection has also affected the overall subjective sleep, sleep latency, duration, sleep efficacy, and disturbance, with their mean [SD] scores of 2.77 [.42], 2.99 [.11],.58 [.54],.99 [.76], 2.68 [.47] respectively (Table 2). The result also showed difference among participants on sleep disturbance domain. Those who hospitalized due to COVID-19 scored higher (Mean= 2.72; SD=.45) than non-hospitalized participants (Mean= 2.63; SD=.49).

psychological distress and poor sleep quality, as well as higher DERS scale dimensions and PSQI scores. The total mean DERS score of 99.91 in our sample indicates that people who had recovered from COVID-19 had higher emotional dysregulation. Various studies have also showed that the general public is suffering more psychological disorders as a result of the COVID-19 pandemic, as well as a disturbance in their emotional regulation (Shah et al., 2020; Bhat et al., 2020; Saladino et al., 2020; Mak et al., 2009).

Furthermore, our findings suggest that emotional dysregulation may contribute to the emergence of psychological distress in COVID-19 survivors. As a result, emotion regulation deficits have been reported in healthy people at risk for psychopathology, and they may play a role in the development of psychiatric symptoms under stressful events (Sheppes et al., 2015).

**Table 3:** Summary of ANOVA for PSQI and DERS

		Sum of Squares	df	F
Global Score PSQI	Between Groups	12.154	1	5.745*
	Within Groups	152.333	72	
	Total	164.486	73	
Total Emotional Dysregulation	Between Groups	2.898	1	.007
	Within Groups	29041.440	72	
	Total	29044.338	73	

\* Significant at.001 level

The mean PSQI score was significantly higher in the non-hospitalized patients compared to hospitalized patients (10.91 ± 1.83 vs.10.10 ±.99; p-value <0.0001) (Table 3).

**4. Discussion**

Individual emotional responses to major infectious disease epidemics are expected to involve widespread anxiety and uncertainty, which, along with societal and economic repercussions, might result in a significant mental health burden (Brooks et al., 2020). In the current study, people who fully recovered from COVID-19 had considerably more

Despite this, there has been little research on the specific interaction between psychological distress and emotional dysregulation. Psychological distress was shown to be linked with all DERS dimensions except Awareness, as well as the Strategies, Impulse, and Clarity subscales in a small sample of individuals with alcohol use disorder (Ruganci & Gençöz, 2010; Ottonello et al., 2019). According to the current findings, the lack of non-acceptance of emotional responses and lack of awareness/clarity of emotions, both DERS characteristics, can be linked to post-COVID-19 related psychological distress. The inclination for mood and energy swings might also be connected to a lack of awareness/clarity regarding the nature of one's own emotions. These can put individual at risk for mental illness, particularly anxiety and depressive disorders (Kessler et al., 2002; Vasiliadis et al., 2015).

In our study, regardless of their history of hospitalization or non-hospitalization, the mean PSQI score (10.49) was significantly higher in the post-COVID-19 recovered group. The mean global score in our study was greater than the recommended score of >5, indicating poor sleep quality. In

various researches, insomnia has been identified as one of the symptoms associated with long COVID. According to a follow-up study, after recovering from COVID-19, 26% (n=1733) patients in China experienced sleep disturbances (Huang et al., 2021). A study of 507 people was undertaken to examine sleep disturbances between non-COVID, COVID positive, and post COVID patients using the Insomnia Severity Index. Patients with long COVID had a higher prevalence of insomnia, as well as a lower overall quality of life, according to the findings by Orru et al. (2021). In a case study of post-COVID-19 patients released from the University of Virginia ICU, 22% of patients had new-onset insomnia (Ramani et al., 2021).

Sleep disturbance can be triggered by hospitalization or home isolation, and our study found that sleep disturbance was more prevalent in patients hospitalized during COVID-19 infection compared to those in home isolation on PSQI subscales. In patients, we found that they had a prolonged sleep latency, subjective sleep, sleep disturbance, and sleep dysfunction.

Insomnia is a disorder that has a detrimental influence on a person's life. It can also cause problems with cognitive function, productivity, irritation, and interpersonal relationships (Matterson-Rusby et al., 2010). In the current study, higher scores on sub-scales of emotional dysregulation (non-acceptance, impulsivity, and less clarity in emotion regulation) might be explained by poor sleep quality. Furthermore, persistent sleeplessness has been linked to an increased risk of pain disorders and other physical manifestations, according to research by Matterson-Rusby et al. (2010). Long-term sleep deprivation, according to Besedovsky et al. (2012), causes the production of pro-inflammatory cytokines which causes moderated inflammation and decreases immunity. All these manifestations result in a lower quality of life and a longer recovery period (Li et al., 2021).

## 5. Implications and Future Direction

Our findings suggest that prior COVID-19 exposure has long-term effects on emotional health and sleep quality, placing the individual at risk for mental health problems. Based on our findings, we believe that people who have recovered from COVID-19 should be evaluated for long-term COVID symptoms and should be considered for future studies.

## 6. Limitations

First, because the study was done in a single private clinic in a specific state, care must be exercised when extrapolating the findings to the general population. Second, there was no documentation of individuals' sleep patterns before to COVID-19, as well as no treatment data. These considerations should be made in order to extrapolate findings.

## 7. Conclusion

In this study, findings indicated that patients who recovered from COVID-19 had more difficulty controlling emotions

and had more sleep disturbance. Lack of awareness of one's emotions may lead to a propensity to mood changes and other physical manifestations such as sleep disturbances, all of which can exacerbate one's psychological state. It is critical to identify and treat individuals with emotional dysregulation and sleep disturbances as soon as in order to avoid long term negative impact.

**Conflict of Interest:** Nil

**Source of support:** Nil

**Acknowledgements:** None.

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