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The Relationship between Personality Traits, Emotional Intelligence, and Covid-19 Severity: A Cross-Sectional Study

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ABSTRACT

The Coronavirus Disease-19 (COVID-19) pandemic affected the entire world during the last few years, creating long-term social and economic problems in the aftermath. The current study investigated how long-term psychological variables, such as personality, trait emotional intelligence, and other socio-demographic factors were related to the severity of the COVID-19 infection. The objective was to explore if there were significant correlations between personality traits and emotional competence (commonly referred to as emotional intelligence) and the severity of the COVID-19 disease and post-COVID adjustment in a group of patients who had suffered from COVID-19. A stratified random sample of 52 patients followed up by the post-COVID clinic of the University Hospital of the General Sir John Kotelawala Defence University (UHKDU) participated in the study. Their personality was measured using an adapted Sinhala version of the Big Five Inventory (BFI), and their trait emotional intelligence was measured by an adapted Sinhala version of the Trait Emotional Intelligence Questionnaire-Short Form (TEIQUE-SF). Socio-demographic variables were also recorded. The results of this study show that personality traits or traits of emotional intelligence were not significantly related to the severity of the COVID-19 infection. Out of the measured socio-demographic variables, employment status was observed to be the only variable to have an association with the severity of COVID-19. According to the findings of the current study, it was concluded that most psychiatric symptoms reported in post-COVID syndrome are more likely to be related to the infection than to the premorbid personality or other long-term psychological variables. Short-term stress due to unemployment appears to predispose individuals to more severe forms of COVID-19.

KEYWORDS: Severity, Post-Covid Syndrome, Personality, Emotional Intelligence

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INTRODUCTION

Impact of COVID-19

The Coronavirus Disease-19 (COVID-19) pandemic affected the entire world. In this context, the global village concept of development and other technological advances such as fast transport options that connected human beings all over the globe were also proven to be risk factors. In fact, the pandemic showed that unless the entire world is safe, not a single place in the world will be safe from viral outbreaks. Thus, from the beginning itself, researchers and scientists working on managing and studying various aspects of SARS-CoV-2 have shared their knowledge and other scientific developments on global platforms, enabling each other to benefit from the increasing accumulation of knowledge (H H S Tech group, 2024).

At the time the research was carried out, the global rates of death due to COVID-19 were declining, and this trend was observed since August 2021. As of June 2024, there have been 775,522,404 confirmed cases of COVID-19 and 7,049,617 deaths (World Health Organization, 2024). In Southeast Asia alone, there were 61,289,673 confirmed cases (World Health Organization, 2024). While in Sri Lanka, there have been 672,763 confirmed cases of COVID-19, with 16,901 deaths (World Health Organization, 2024).

Physiological factors that affect COVID-19 disease severity

Despite the staggering number of COVID-19 infections, one crucial area of research focuses on the factors that influence disease severity. The progression of COVID-19 into severe cases served as a predictor for higher mortality rates during the pandemic. Among the currently identified risk factors for progressing into severe COVID-19 are increased age and comorbidities such as obesity, asthma, cardiovascular disease, diabetes, liver disease, and dementia. These factors have also been identified as risk factors for developing severe COVID-19 in young adults (Yek, 2022). Among other risk factors are male sex, advancing age (>45 years vs. younger), black race or ethnicity, homelessness and low income, and a sedentary lifestyle, which is associated with higher serum prostaglandin E2 levels (Ricke-Hoch et al., 2021).

Most studies have concentrated on the physical risk factors for severe COVID-19. Understanding these factors is crucial for reducing the mortality rate from the disease.

Psychological aspects and COVID-19

In addition to physiological factors, psychological aspects of a person are also important in coping with any disease and its subsequent outcomes. This is a well-established tenet in health psychology. The field of health psychology focuses on studying and addressing psychological factors that impact physical health, merging important psychological aspects that may have significant implications for COVID-19 outcomes.

Research has identified COVID-19 Stress Syndrome (CSS), which includes xenophobic fears (the fear that COVID-19 is spread by foreigners), COVID-19-related traumatic stress symptoms such as nightmares, and compulsive checking and reassurance seeking (Taylor, Fong and Asmundson, 2021). Studies have observed that personality traits may be important for COVID-19 outcomes (Rettew et al., 2021), while some studies have shown that emotional intelligence may be a stronger factor compared to personality in determining mental health outcomes in relation to COVID-19 (Prentice, Zeidan and Wang, 2020).

Emerging research has identified a range of post-COVID symptoms, commonly referred to as post-COVID syndrome due to the lack of standardized terminology. These symptoms, which can persist for many months after the initial infection, often include psychological aspects such as anxiety, depression, and cognitive impairments. Understanding both the subjective and objective nature of these symptoms is crucial for addressing the mental health challenges faced by COVID-19 survivors (Española De Quimioterapia et al., 2021).

Rationale

Given the current research suggesting that psychological factors play a crucial role in overall health and particularly in COVID-19, the researchers investigated whether significant correlations exist between personality traits and emotional intelligence with the severity of COVID-19 in patients who have experienced the disease.

Knowledge of such correlations can be used in designing holistic interventions for COVID-19 patients. Further, such knowledge can be used in health psychology to design holistic care for similar health conditions. In addition, the study can provide insights into which personal and emotional factors may predispose individuals to severe impacts from COVID-19 and may be important in preventive psychological measures.

Objectives

The primary objective of this study was to describe the relationship between personality and emotional factors in the severity level of COVID-19. The specific objectives were to describe the associations between COVID-19 severity, personality traits, and trait emotional intelligence. Additionally, this study examined the relationship between COVID-19 severity and various factors, including personality traits, emotional intelligence, and other demographic characteristics of the patients.

METHODOLOGY

A retrospective cross-sectional study was conducted at the University Hospital of General Sir John Kotelawala Defence University (UHKDU). Fifty-two (52) patients followed up by the post-COVID clinic of UHKDU were recruited for the study. All participants were over 18 years of age and in remission from the active stages of COVID-19. Patients who tested positive for COVID-19 at the time of the interview were excluded.

The Ethics Review Committee (ERC) of the Faculty of Medicine, General Sir John Kotelawala Defence University (KDU) provided ethical clearance for this study (RP/2022/10).

Sampling method

A stratified random sample out of 120 patients who were followed up by the post-COVID-19 clinic of UHKDU participated in the study. A method of proportional allocation was used to determine the sample size. The population was divided into five strata based on their COVID-19 disease severity. Each of these strata was further divided into two strata based on their gender proportions. The below-mentioned stratified random sampling formula was used to calculate the sample size.

Sample size of the strata = (Size of the entire sample / Population size) × Stratum size has been used to calculate the sample size of each stratum (Etikan, 2021).

Stratified random sampling was employed to account for the variation in outcomes among patients infected with COVID-19. This method involves dividing the population into distinct subgroups, or strata, based on specific characteristics such as disease severity or gender. By ensuring that each stratum is adequately represented in the sample, stratified sampling helps to control for variations within these subgroups. This approach is expected to provide more accurate and

reliable data, as it allows for a more precise analysis of the different levels of disease outcomes among the patients (Shannon et al., 2018).

Study instruments and variables

Measures of personality and emotional intelligence

TEIQue- SF

Trait Emotional intelligence was enumerated as a score yielded by the Trait Emotional Intelligence Questionnaire Short Form (TEIQue-SF). This is a 30-item, self-report questionnaire designed to measure the trait of emotional intelligence (Psychometriclab.com, n.d.). The completion time for the tool was five minutes. The Trait Emotional Intelligence Questionnaire - Short Form (TEIQUE-SF) have shown good psychometric validity and have been used in many studies (Petrides, 2009; Andrei et al., 2015; Di Fabio and Saklofske, 2020).

BFI (The Big Five Personality Inventory)

Personality traits were enumerated as a score yielded by the BFI. The completion time was 20 minutes. The BFI has been used in many other similar studies and has shown good psychometric validity (John OP et al.,2012; Alansari, 2016).

Both tools mentioned above were adapted to Sinhala using the World Health Organization (WHO) recommended methodology for adapting psychometric tools for research (WHO, n.d.). During the preliminary discussions of the study, it was identified that there were no Tamil speakers who were followed up by the post-covid clinic. Therefore, an adaptation to Tamil was not carried out.

Both tools were freely available on their respective websites, with permission to be translated and adapted. During the adaptation process, the authors were updated with the final Sinhala versions and the back translations (the process of translating the Sinhala versions back into the original language to check for accuracy) of the scales.

Socio-demographic information of the participants was recorded using a self-developed socio-demographic data collection form.

Measurement of COVID 19 infection severity

The severity of the infection was classified as per the NIH Disease Severity Classification (NIH, 2021).

a. Asymptomatic or Pre-symptomatic Infection: Individuals who test positive for SARS-CoV-2 using a virologic test (i.e., a nucleic acid amplification test [NAAT]

or an antigen test) but who have no symptoms that are consistent with COVID-19.

b. Mild Illness: Individuals who show many symptoms of COVID-19 such as fever, nausea, vomiting, diarrhea, sore throat, cough, headache, malaise, muscle pain, and loss of smell and taste, yet who do not have symptoms like shortness of breath, dyspnea, or abnormal chest imaging.

c. Moderate Illness: Individuals who indicate lower respiratory disease (pneumonia) during clinical assessment or imaging and who have an oxygen saturation (SpO2) ≥94% on room air at sea level.

d. Severe Illness: Individuals who show evidence of pneumonia and have SpO2 <94% on room air at sea level, a ratio of arterial partial pressure of oxygen to fraction of inspired oxygen (PaO2/FiO2) <300 mm Hg, respiratory frequency >30 breaths/min, or lung infiltrates >50%.

e. Critical Illness: Individuals who have respiratory failure, septic shock, and/or multiple organ dysfunction.

Presence of comorbidities: Diabetes, hypertension, asthma, chronic obstructive pulmonary disease (COPD), obesity, chronic kidney disease (CKD) (eGFR <60 for 3 months or renal damage as evidenced by albuminuria - >30 mg/g, imaging or/ pathological evidence of kidney damage or post-transplant), cirrhosis, any other disease according to the judgement of the managing clinician that warrants treatment at a hospital setting.

Additional classifications used in the study

f. COVID pneumonia: Patients' oxygen saturation is considered <95% on air or any oxygen or ventilatory support. Radiological guidance with a chest x-ray and HRCT was performed to identify the extent of pneumonia and its severity.

The interpretation of the X-rays was done using the RALE classification system. This system was presented by Wong et al. and published in "Radiology" in March 2020. Each lung was assessed individually and depending on the extent of involvement by consolidation or ground-glass opacity, a score of 0 to 4 points was given (0 = no involvement; 1 = less than 25%; 2 = 25% to 50%; 3 = 50% to 75%; 4 = more than 75% involvement). The overall score was the sum of points from both lungs.

A total severity score was used to evaluate the extent of the HRCT abnormalities. This method was presented by Kunwei et al. and was published in “European Radiology” in March 2020 (Li et al., 2020). In this classification system, each of the five lobes of the lungs was evaluated for the presence of inflammatory abnormalities, including the presence of ground-glass opacities, mixed ground-glass opacities, or consolidation. Each lobe could be awarded 0 to 4 points, depending on the percentage of the involved lobe: 0 (0%), 1 (1-25%), 2 (26-50%), 3 (51-75%), or 4 (76-100%).

Procedure

The number of participants who were assigned to each stratum of the sample was recruited for the study randomly using the clinic registry. These participants were contacted via telephone by a research team member to make them aware that there is a study being conducted and if they would like to receive information on the study to decide if they would like to participate in the study. The research assistant was trained regarding the key messages that were imparted in this initial contact with the patients.

Following the verbal consent of the participants to receive information, they were provided with the introduction to the study and the consent form. Once these had been filled out and sent back, the patients were given psychometric scales and the demographic information sheet to be filled out. The patients were provided a hard copy or an e-copy, depending on the patient’s preference. Patients who requested hard copies were provided with a stamped return envelope to ensure the patient did not bear any cost by participating in the study.

Data analysis

Initially, data cleaning and checks were performed, and IBM SPSS software was used to carry out descriptive statistics. A regression analysis was conducted using the IBM SPSS software among the scores yielded for each of the quantified variables and the demographic factors. The Pearson correlation coefficient was used to measure the strength of association between variables.

RESULTS AND DISCUSSION

Demographic factors and COVID severity

When the demographic factors and COVID severity were correlated, age, highest educational qualification, marital status, number of children, age of the youngest child, the number of times the participant has been diagnosed with COVID-19, or

income did not demonstrate a significant relationship to the level of severity of the COVID-19 infection (Table 1).

Employment status was observed to have a statistically significant, moderately negative correlation to the severity level of COVID-19 infection (R = -0.440, p = 0.001).

Table 1: Correlation between Demographic factors and the severity of the COVID – 19 infections

Demographic factor	**Perason's correlation coefficient**
Age	R= -0.195, P=0.170
Employment status	R= -0.440, P=0.001
Marital status	R= -0.101, P=0.481
Number of times diagnosed with COVID	R= -0.123, P= 0.394
Income	R= 0.275, P=0.051

Source: Developed by the Author

There was no significant relationship observed between the five personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) measured by the Big Five Inventory and the severity of the COVID–19 infection (Table 2).

Table 2: Correlation between five personality traits and the severity of the COVID – 19 infections

Personality trait	**Pearson correlation coefficient**
1. Openness	R= - 0.015, P=0.981
2. Conscientiousness	R= - 0.090, P= 0.531
3. Extraversion	R= 0.121, P= 0.399
4. Agreeableness	R= - 0.019, P= 0.894
5. Neuroticism	R= - 0.102, P= 0.475

Source: Developed by the Author

TEIQUE scores and COVID severity:

According to the current study, there was no significant relationship between the overall TEIQUE scores and the level of severity of the COVID-19 infection ($R = 0.082$, $p = 0.575$). There was no statistically significant correlation between individual items of TEIQUE and the severity level either.

DISCUSSION

A significant proportion of patients who had COVID-19 infections are believed to have continued symptoms, which is referred to as long COVID or post-COVID syndrome. Of these patients, psychiatric symptoms, including depression, anxiety, post-traumatic symptoms, and impaired cognitive impairment, have been observed in a significant proportion of patients. It is also believed that the risk of suicide may be elevated in both patients who develop post-COVID syndrome and those who do not (Sher, 2021). At present, most of these studies are correlational ones, and the mechanisms of causation have not yet been discovered. The current study explores two long-term psychological constructs in people: personality and the trait of emotional intelligence. According to the results of the current study, the two long-term psychological variables do not have a significant relationship to the severity of COVID-19 infections. The fact that no subscale of the BFI or TEIQUE- SF showed a significant relationship to the severity of the COVID-19 infection can be interpreted as an indication that these constructs are not even partly associated with the COVID-19 outcomes.

Past research has demonstrated that most people who go on to develop post-COVID syndrome are people who have had more severe levels of COVID-19 infections (Uniyal et al., 2022). Therefore, the outcomes of the current study suggest that the psychological disturbances that are observed in post-COVID syndrome are more likely to be related to the infection than the premorbid psychological variables of the individual.

In addition to that, it is important to note that most demographic variables also do not seem to have a relationship to the level of severity of the infection. Therefore, we can speculate that COVID-19, like any other communicable disease, can infect any person, irrespective of their sociodemographic variables. It is suggestive that the level of severity of the infection may depend on more biological variables, such as the potency of the virus and the biological condition of the infected, than psychological or other demographic variables. Therefore,

studies on post-COVID syndrome should focus more on the biological mechanisms underlying the disease condition.

It is interesting that, while income does not affect the severity of the infection, being unemployed appears to predispose people to more severe COVID-19 infections (Mirahmadizadeh et al., 2022). Therefore, the short-term stress and anxiety caused by being unemployed may be more significant in the COVID-19 infection than long-term economic factors and other demographic factors. It would be interesting for future researchers to explore whether short-term stress is more detrimental to infectious diseases compared to more stable psychological constructs such as personality traits.

It would be of particular interest to explore if short-term negative emotions such as stress, anxiety, and fear which are generated by the pandemic itself, increase the risk of acquiring the infection and subsequent severity of the infection. (Manchia et al., 2021; Bhattacharjee and Ghosh, 2021).

Since long-term psychological constructs do not appear to be associated with infection severity in COVID–19, it could be that short-term emotional status is more important in infectious diseases.

On the other hand, a pandemic is more likely to be once in a lifetime experience for an individual. Therefore, the long-term psychological repertoire of the individual may not be sufficiently prepared or equipped to handle the situation. Therefore, individual reactions could be based on other contextual variables in the immediate environment of the individual who is facing the pandemic. Therefore, long-term psychological constructs such as personality or trait emotional intelligence may have little predictive value in terms of the psychological outcomes of the person. It is expected that future researchers will attempt to explore these variables.

LIMITATIONS

The current study is a single-center, hospital-based study. Therefore, the findings cannot be extrapolated to the wider community. Large, population-size studies are required to further explore the correlation between COVID-19 disease severity, post-COVID adjustment, individual personality traits, and trait emotional intelligence.

CONCLUSION

It can be concluded that most psychiatric symptoms reported in post-COVID syndrome may be more related to the infection than the premorbid personality or other long-term psychological variables. Short-term stress due to unemployment appears to predispose individuals to more severe forms of COVID-19 infection.

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