ORIGINAL ARTICLE

Post COVID-19 Status of Low Back Pain: An Observational Study

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Abstract

Background: Low back pain in COVID-19 occurs mainly due to muscle pain, neuropathic pain, and joint pain, mainly facet joints. Neuropathic pain occurs when COVID-19 affects the central nervous system. Neurogenic invasion is the commonest cause. Viral infection can injure the peripheral nervous system by directly affecting the microbes and secondary immune over activation. This study aimed to explore the characteristics of changes related to pain and functional limitations in patients with low back pain who became infected with the SARS-CoV-2 virus.

Methods: This is an observational study that was carried out in the pain clinic, Department of Anesthesia, Analgesia, and Intensive Care Medicine, BMU. Each patient was asked for changes involving low back pain intensity using the visual analogue scale (VAS), which measures pain intensity before and after COVID-19, functional limitations that occur after COVID-19 using the post-COVID-19 functional status scale (PCFS), and anxiety and depression after COVID-19, by using the hospital acquired anxiety and depression scale (HADS). The response was documented in a data sheet and statistical analysis was carried out by using the Statistical Package for Social Sciences (SPSS) version 23.0 for Windows.

Results: Out of 96 patients initially experiencing mild pain before COVID-19 infection, 39 cases (70.9%) transitioned to moderate pain, while 16 cases (29.1%) deteriorated to severe pain post COVID-19 infection. Among the total 41 cases initially experiencing moderate pain before COVID-19 infection, 13 (31.7%) remain moderate, while 28 (68.3%) cases deteriorated to severe pain after COVID-19 infection. This association was not statistically significant ($p > 0.711$). The association of VAS score with PCFS score of patients was found to be statistically significant, (p value 0.001). The association of VAS score with HADS score of patients was also observed. The p value of HADS-D is 0.176 and HADS-A is 0.039.

Conclusion: The present study revealed increased pain intensity and limited functional status after COVID-19 infection.

Keywords: COVID-19, VAS Score, PCFS Score, HADS score, Anxiety, Depression.

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Introduction

The coronavirus disease 2019 (COVID-19) pandemic has profoundly altered how people live around the world. SARS-CoV-2, the pathogen responsible for coronavirus illness, has caused unprecedented global mortality and morbidity[1]. Because of the virus's rapid global spread, the World Health Organization (WHO) declared it a pandemic in March 2020. According to reports, COVID-19 individuals' incubation time ranges between 1 and 14 days, with symptoms appearing 3 to 7 days later. The spectrum of illness induced by SARS-CoV-2 is currently known as Coronavirus Disease 2019. Despite huge efforts to suppress the virus in China, it has spread over the world. As of March 23, 2020, there were 351,731 COVID-19 cases worldwide; 15,374 deaths; 100,430 recovered[2]. Lack of focused therapy and vaccines contributes to the spread of infection. Infection symptoms are typically nonspecific, ranging from a simple cold to a severe, potentially fatal, respiratory infection. Early findings indicate that SARS-CoV-2 infection causes lasting consequences such as fatigue, dyspnea, chest pain, cognitive difficulties, arthralgia, and a reduction in quality of life. Cellular damage, a vigorous innate immune response with inflammatory cytokine release, and a procoagulant condition caused by SARS-CoV-2 infection may all contribute to these complications.

Pain is an unpleasant sensory and emotional experience associated with or resembling that associated with, actual or potential tissue damage[3]. Two forms of pain have been recognized. One is nociceptive, the other is neuropathic. Nociceptive pain is defined as pain caused by the activation of the peripheral receptive terminals of primary afferent neurons in response to painful chemical, mechanical, or thermal stimuli.
Current hypotheses suggest that the SARS-CoV-2 cytokine and interleukin-associated storm may sensitize pain circuits. As a result, patients experiencing post-COVID discomfort may experience nociceptive symptoms[4].

The neuroinvasive potential of SARS-CoV-2 infection is linked to the high expression of angiotensin-converting enzyme 2 (ACE2) receptors seen in nervous system cells, including neurons and microglia in the spinal dorsal horn. This is how neuropathic pain evolved in COVID-19 survivors. During the worldwide COVID-19 outbreak, the incidence of pain would be expected to rise by 3 different ways: (1) by the increasing number of people developing de novo pain as a post-COVID sequelae; (2) by exacerbating pain in infected individuals with pre-existing conditions; (3) by increasing pain symptoms in non-infected people due to COVID-19 surrounding factors (e.g. lockdown, isolation or stress)[4].

Chronic pain has been reported to emerge in relation to psychological stressors, the viral infection itself, or the consequences of admission to intensive care unit (ICU) and may include either regional or widespread pain. There is a relationship between chronic pain and hospitalization for COVID-19 may be due to wide range of pathophysiological consequences, including effects on mood, cognition, sleep, cardiovascular risk, quality of life and general function. Inflammatory mechanisms underlying various chronic pain problems may also predispose patients to more severe COVID-19 infection, necessitating hospitalization. In COVID-19, low back pain is mostly caused by muscular discomfort, neuropathic pain, and joint pain, particularly in the facet joints. COVID-19 affects the central nervous system, resulting in neuropathic pain. Neurogenic invasion is the most common cause. Viral infection can harm the peripheral nerve system by directly affecting microorganisms and causing secondary immune overactivation[4].

Around a quarter of those infected with the virus develop symptoms that last at least a month, while one in ten remain poorly after 12 weeks. Patient groups refer to this as "Long COVID"[5]. Several meta-analyses found that about 60% of COVID-19 survivors will experience post-COVID symptoms in the months following the infection. Although COVID-19 is most usually associated with acute respiratory symptoms, pain is also a typical symptom of the condition.

Musculoskeletal post-COVID discomfort is common, accounting for 19.9% of cases and primarily affecting the lower extremities. It occurs in approximately 7.9% of upper extremity cases, 5.2% of shoulder cases, 5.8% of wrist cases, 19.4% of lower extremity cases, 7.9% of knee cases, 9.1% of cervical cases, 14.1% of thoracic-chest cases, and 6.8% of lumber

spine patients. Scientific and clinical data is emerging on the subacute and long-term effects of COVID-19, which can affect many organ systems[6].

One of the most common reasons of discomfort during a COVID-19 infection is muscle soreness. According to multiple studies, myalgia is one of the most frequent symptoms upon beginning, affecting almost 36% of patients. Pre-existing musculoskeletal pain symptoms were substantially higher ($p< 0.001$) in those reporting musculoskeletal post-COVID pain (49.8%) than in those without post-COVID pain (33.6%)[6]. There were no significant variations in the location of past pain complaints in the body between people who developed musculoskeletal post-COVID pain and those who did not.

A study of 887 patients found that nearly half (n=442) experienced musculoskeletal pain symptoms before infection, while the remaining half (n=445) acquired new onset musculoskeletal post-COVID-related pain and had no symptoms prior to the infection. Among 442 people with previous symptoms, 220 (24.8%) reported that post-COVID pain symptoms were distinct from previous symptomatology (new beginning of musculoskeletal post-COVID pain). The remaining 222 (25.1%) patients reported an increase in their earlier symptoms (exacerbated pain) in terms of intensity (n=89, 40.1%), extension (n=42, 18.9%), frequency (n=55, 24.8%), and both intensity and extension (n=36, 16.2%). The new onset of musculoskeletal discomfort in the overall sample was up to 74.9%[6]. Fatigue is the most frequent symptom in post-COVID syndrome, with prevalence rates ranging from 17.5% to 72%, followed by residual dyspnea, which has a prevalence of 10% to 40%. Mental issues, olfactory and gustatory dysfunctions are prevalent at 26% and 11%, respectively[6].

During the recovery period following acute COVID-19, psychological and cognitive problems are typical. In post-COVID-19 patients, a variety of pulmonary and extrapulmonary characteristics have been documented. These symptoms persist and worsen over time, resulting in low functional status in a subset of these people. COVID-19 infections have been associated with acute respiratory distress syndrome (ARDS), prolonged hospitalization, and admission to an intensive care unit (ICU). In Bangladesh, 20% of Infected cases needed hospital admission & out of them 12% needed ICU support[7] with 77.6% case fatality rate[8].

The physical and mental health assessment of COVID-19 survivors, with a focus on post-acute treatment, has recently become a global health problem. Studies shows that, about 49% cases of post-COVID patients develop low back pain in UK. The goal of this study was to look at the characteristics that are linked to pain and functional limitations in people who have low back pain and become infected with the SARS-COV-2 virus.

Methods

This retrospective observational study was conducted at the Pain Medicine Outpatient Unit, Department of Anesthesia, Analgesia and Intensive Care Medicine, Bangladesh Medical University, Dhaka, Bangladesh. The patients aged more than or equal to 18 years of both sexes suffering from low back pain that started before COVID-19 and whose RT-PCR for COVID-19 was found positive and who recovered from COVID-19 at least 12 months were included in the study. Patients with psychiatric disease, severely diseased patients, and uncontrolled co-morbidities, such as uncontrolled DM, uncontrolled CKD, and preexisting neuropathy were excluded. A total of 96 patients were selected according to selection criteria. The approval was taken from the Institutional Review Board (IRB) of Bangladesh Medical University and informed consent was obtained from patients, who were enrolled in this study.

Study Procedures

Demographic characteristics of all subjects were recorded. Patients were offered a comprehensive medical assessment with detailed history and physical examination. Data of all clinical characteristics, including comorbidities (e.g. Diabetes mellitus, Hypertension, Pain, Bronchial Asthma, COPD, CKD, Headache, Hypothyroidism, and Connective tissue disease), clinical and pharmacological history and body measurements were collected in a structured data collection sheet.

Data on specific symptoms (pain, disability) potentially correlated with COVID-19 was obtained using standardized tools e.g. Visual Analogue Scale (VAS) and Post-COVID-19 Functional Status scale (PCFS). Both the anxiety (HADS-A) and depression (HADS-D) subscales of HADS were assessed. Patients were asked to retrospectively recount the changes of pain intensity before and after COVID-19 and whether each symptom persists at the time of the visit or not.

Study measures

Visual Analogue Scale (VAS): 100 mm Visual analogue scale is a tool used to rate the intensity of pain. A straight line is drawn between two extremes with one end meaning "no pain" at 0 and the other end meaning "maximum pain" at 10. The patients will be asked to rate their pain by placing a mark along the scale between these two extremes. The most common VAS consists of 10 horizontal or vertical line with its two endpoints '0' and '10' representing 'no pain' and 'worst pain ever' (or similar verbal descriptions), respectively[9].

Post-COVID-19 Functional Status scale[10] (PCFS): It is an ordinal tool, proposed to measure the full spectrum of functional outcomes following COVID-19. This post-COVID-19 Functional Status (PCFS) Scale can be used for tracking functional status over time as well as for research purposes. This scale was developed after discussion with international experts (via a Delphi analysis) with input from patients (via patient focus groups). The inter-observer agreement of scale grade assignment was shown to be good-to-excellent with kappa's of 0.75 (95% CI 0.581.0) and 1.0 (95% CI 0.831.0) between self-reported values and independent raters, respectively. The PCFS Scale can be used both at the time of hospital discharge, and to monitor functional status after discharge. This scale is used to assess the level of impairment also.The PCFS Scale stratification is composed of five grades:
Grade 0 (No functional limitations);
Grade 1 (Negligible functional limitations);
Grade 2 (Slight functional limitations);
Grade 3 (Moderate functional limitations) and
Grade 4 (Severe functional limitations).

Hospital Anxiety and Depression Scale: It is one of the National Institute for Health and Care Excellence (NICE) recommended tools for diagnosis of depression and anxiety. This scale is simple and easy to use. Anxiety often precedes depression in response to stressors. The questionnaire comprises seven questions for anxiety and seven questions for depression and takes 2-5 min to complete. For both scales, scores of less than 7 indicate non-cases. 8-10 is mild, 11-14 is moderate and 15-21 is a severe case. The HADS questionnaire has been validated in many languages, countries, and settings including general practice and community settings. A literature review of a large number of studies identified a cut-off point of 8/21 for anxiety or depression. For anxiety (HADS-A) this gave a specificity of 0.78 and a sensitivity of 0.9. For depression (HADS-D) this gave a specificity of 0.79 and a sensitivity of 0.83[11].

Statistical analysis:

Statistical analysis was carried out by using the Statistical Package for Social Sciences version 23.0 for Windows (SPSS Inc., Chicago, Illinois, USA). A descriptive analysis was performed for all data. The mean values were calculated for continuous variables. The quantitative observations were indicated by frequencies and percentages. Unpaired t-test was used for continuous variables. ANOVA test was used to analyze the continuous variables, shown with mean and standard deviation. p values <0.05 was considered as statistically significant.

Results

A total 96 patients suffering from low back pain, at least 12 months after COVID-19 infection were enrolled and evaluated. The majority 42(43.8%) of the respondents belonged to age group 33-44 years, 25(26.0%) had age 20-32 years and 17 (17.7%) were in the 45-56 years. The mean age was 40.64 years with standard deviation ±11.18 years. Minimum and maximum ages were 20 and 68 years respectively. Regarding gender distribution 29(30.2%) respondent were male and 67(69.8%) were female. While comparing occupation we found majority of the respondents 63(65.6%) were housewife, 17(17.7%) were service holder, 7(7.3%) were businessman and 5(5.2%) were student. Regarding marital status 92(95.8%) respondent were married and 4(4.2%) were unmarried. Smoking history of the respondent where 4(4.2%) were smoker and 34(35.4%) had drug history. Comorbidities were present in 13(13.5%). Table I

showed the socio-demographic profile of the studied population.

Table I: Distribution of socio-demographic character of the respondents (n=96)

Age group	Number	Percentage
20-32 years	25	26.0
33-44 years	42	43.8
45-56 years	17	17.7
57-68 years	12	12.5
Total	96	100.0
Gender		
Male	29	30.2
Female	67	69.8
Occupation		
Student	5	5.2
Housewife	63	65.6
Businessman	7	7.3
Service	17	17.7
Others	4	4.2
Total	96	100
Marital status		
Married	92	95.8
Unmarried	4	4.2
Smoking history		
Smoker	4	4.2
Medication history		
Yes	34	35.4
Comorbidities		
Yes	13	13.5

Values are expressed as absolute number and percentages.

Table II illustrates the presence of taking analgesics was higher 29(27.84%) among the respondents. The second highest taking antihypertensive was 8(7.68%) and oral hypoglycemic was 5(4.8%).

Table II: Distribution of the respondents by types of drugs

Medication history	Number	Percentage (%)
Analgesics	29	27.84*
Antihypertensive	8	7.68*
Oral hypoglycemic agent	5	4.8*
Thyroid replacement	2	1.92*
Steroid	1	0.96*
DMRDs	1	0.96*
pregabalin	1	0.96*

Data are presented as absolute number and percentages. * Multiple response

The average VAS score before COVID-19 was 3.13 with a standard deviation of 1.8. This indicates that, on average, individuals experienced mild to moderate pain or discomfort, with some variation among individuals. The average VAS score after COVID-19 increased to 7.38 with a standard deviation of 1.2. This significant increase suggests that individuals experienced much higher levels of pain or discomfort after the onset of the pandemic (p=0.001).

Table III: Distribution of the respondent according to PCFS score (n=96)

Variable	Number	Percentage
PCFS score		
Grade 1	1	1.0
Grade 2	63	65.6
Grade 3	31	32.3
Grade 4	1	1.0

Data are presented as absolute numbers and percentages.

Table III shows the distribution of the respondents according to PCSF score where 63(65.6%) belong to grade 2, 31(32.3%) belong to grade 3, and 1(1.0%) belongs to grades 1 and 4 respectively.

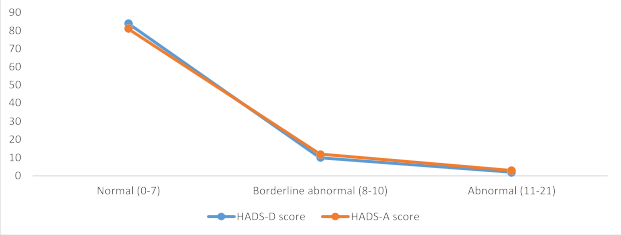

Figure 1: Distribution of the patients according to HADS-A and HADS-D score

About 84(87.5%) respondents had normal HADS-D score, 10(10.4%) had borderline abnormal and 2(2.1%) had abnormal HADS-D score. On the other hand, 81(84.4%) patients had normal HADS-A score, 12(12.5%) had borderline abnormal, and 3(3.1%) had abnormal HADS-A score (Figure 1). The average anxiety score among the patients was 5.63±2.0 and the average depression score among the patients was 5.22±1.9.

The table IV shows the distribution of VAS scores across different grades of PCFS, indicating the functional impact on individuals. For Grade 1, there was only one individual, who had a VAS score between 4-6, with no individuals scoring between 7-9; this

Table IV: Association of VAS score and PCFS score of patients (n=96)

PCFS score	VAS score After COVID19		Total	P value
Grade 1	1(100.0%)	0 (0.0%)	1	0.38
Grade 2	43 (68.3%)	20 (31.7%)	63	0.03
Grade 3	8 (25.8%)	23(74.2%)	31	0.01
Grade 4	0 (0.00%)	1 (100.0%)	1	0.38
Total	52 (54.2%)	44 (45.8%)	96	0.001

Data are presented as absolute numbers and percentages. P value reached from Chi square test

result was not statistically significant (p = 0.38). In Grade 2, of the 63 individuals, 43 (68.3%) had VAS scores 4-6, while 20 (31.7%) had scores 7-9, showing a statistically significant difference (p = 0.03). For Grade 3, 8 out of 31 individuals (25.8%) had scores between 4-6, and the remaining 23 (74.2%) had higher scores (7-9), with a significant p-value of 0.01. In Grade 4, only one individual had a VAS score of 7-9, with no individuals scoring 4-6, and this result was not statistically significant (p = 0.38). This association suggests an increase VAS scores with higher PCFS grades, with significant differences observed in Grades 2 and 3.

Table V: Univariate logistic regression of risk factors for patients

Attribute	Co-efficient (B)	S. E	OR	95% CI for CI		p-value
				Upper	Lower	
Age						
20-44 years	-0.539	0.448	0.583	1.404	0.242	0.229ns
45-70 years**						
Gender						
Male	-0.463	0.454	0.630	1.533	0.259	0.308 ns
Female**						
Marital status						
Married	0.968	1.173	2.633	26.257	0.264	0.409 ns
Unmarried **						
Comorbidity						
Present	1.127	0.641	3.08	10.833	0.879	0.079ns
Absent **						
Drug history						
Yes	-0.628	0.432	0.533	1.243	0.229	0.145ns
No **						
VAS before score						
Score (1-3)	1.658	0.448	5.250	12.635	2.181	0.001s
Score (4-6)**						

** Reference category, ns: non-significant, s: significant. Univariate logistic regression was done. Data were presented as Odds ratio, 95% confidence interval.

In case of HADS-D, among the 84 respondents from score normal (0-7), 48(57.1%) had moderate VAS score and 36 (42.9%) had severe VAS score, among 10 respondents from Borderline abnormal (8-10), 4 (40.0%) had moderate VAS score and 6 (60.0%) had severe VAS score. The association was not significant. In case of HADS-A, among 81 respondents from score normal (0-7), 48(59.3%) had moderate VAS score and 33 (40.7%) had severe VAS score. Among 12 respondents from Borderline abnormal (8-10), 4 (33.3%) had moderate VAS score and 8 (66.7%) had severe VAS score. The association was significant.

VAS score before COVID-19 exhibited significant increases in the odds of developing low back pain by 5.250 (95% CI: 2.181-12.635) times (p-value: 0.001). Comorbidity illustrated an increase in the odds of developing low back pain by 3.08 times (95% CI: 0.87-10.83) (p-value: 0.079). Marital status was found to increase the chance of developing low back pain with odds of 2.63 (95% CI: 0.264-26.25) (p-value: 0.409). Age, gender and drug history has no risk of developing low back pain.

Discussion

The COVID-19 pandemic has affected every aspect of life, including the behavior of populations and daily routines, especially with the instituted mitigation measures and lockdowns. It has been reported that those suffering from chronic back pain are more susceptible to experiencing back pain during periods of additional stressors such as COVID-19. Therefore, the possible reason for this enhanced back pain complaint could be originating due to imposed COVID-19 lifestyle changes. A total of 96 patients agreed to participate in this study and were considered eligible. The aim of this study was to identify the clinical and psychosocial profile associated with pain in non-hospitalized patients with post-COVID-19 syndrome. The results have shown that patients with post-COVID-19 syndrome have obtained higher scores in pain intensity and interfered with the PCFS score and HADS score.

This study showed similar patterns of self-reported low back pain before and after the pandemic, like Caputo et al.(2023)[12]. A study conducted by Amelot et

al.(2022)[13] had 50 patients with chronic low back pain (CLBP), of whom 26 (52%) were women and 24 (48%) were men, which is similar to our study. In this study the main age group involve was 33-44 years. 42 (43.8%) cases belongs to this group with mean age was 40.64 years with standard deviation ±11.18 years. According to Ahmed et al.(2021)[14] the main age group of the patient was 18–29 years which is not similar to this study. Hossain et al.(2022)[15] assessed pain among the patients recovered from COVID-19 in Bangladesh and the average age of the participants was 46.8±14.3 years with a male to female ratio of 1.3:1.

This study shows that occupation of the respondent, where majority of the respondent 63(65.6%) were housewife, 17(17.7%) were service holder 5(5.2%) were student , 7(7.3%) were businessman and 4(4.2%) were unemployed which is similar to the study conducted by Ahmed et al.(2022)[14] Regarding marital status 92(95.8%) respondent were married and 4(4.2%) were unmarried. The present study shows smoking history of the patients where 4(4.2%) were smoker and 92(95.8%) were non-smoker which is not similar to the findings of Calvache-Mateo et al.(2023)[16] Another study done by Hossain et al.(2023)[15] found that most of their patients 27 (35.5%) were service holder and 21 (27.6%) were housewife. They also stated that 44 (57.9%) patients were non-smoker, 20 (26.3%) were current smoker and 12 (15.8%) patients were past smoker.

In this study, 34(35.4%) had medication history and 62(64.6%) had no drug history. Another study conducted by Calvache-Mateo et al.(2023)[16] had non-pharmacologic treatment which is 40% and similar to this study. But Hosssain et al.(2023)[15] found different results in their study where 30-50% of the patients received various medications during COVID-19 infection.

A study conducted by Fernández-de-las-Peñas et al.(2022)[6] had medical co-morbidities such as Hypertension 514 (26.1%) Diabetes 236 (12.0%) Cardiovascular Disease 234 (11.9%) Asthma 126 (6.4%) Obesity 88 (4.5%) Chronic Obstructive Pulmonary Disease 77 (3.9%) Stroke 38 (2.0%) Rheumatological Disease 31 (1.6%) Other (Cancer, Kidney Disease). In this study comorbidities are present in 13(13.5%) and absent in 83(86.5%). The results are not in concordance with another study done in Bangladesh where comorbidities were present in more than 50% of the patients[15].

Murat et al.(2021)[17] conducted a study where patients with pain complaints had a mean VAS score of 4.8 (3.7), which is not similar to our study. In this study, the VAS score before COVID-19 shows that the majority of the respondents, 55 (57.3%) had a mild (score 1-3), 41 (42.7%) showed a moderate score (score 4-6), mean±SD (3.13±1.8). In VAS Score after COVID 19 shows, majority of the respondent 52(54.2%) had moderate (score 4-6), 44 (45.8%) shows severe (score 7-9), and mean±SD is 7.38±1.2.

A study conducted by Goudman et al.(2021)[18] concerning the PCFS found that 37 persons (7.34%) had no functional limitations (grade 0), 46 (9.13%) had negligible functional limitations (grade 1), 188 (37.30%) reported slight functional limitations (grade 2), 216 (42.86%) indicated moderate functional limitations (grade 3), and 17 (3.37%) reported severe functional limitations (grade 4). The present study shows the distribution of the respondent according to PCSF score, where 63 (65.6%) belongs to grade 2, 31 (32.3%) belongs to grade 3, and 1 (1.0%) belongs to grades 1 and 4, respectively. Another study done by Hossain et al.(2022)[10] described the frequency of PCFS score among their studied group and stated that 39.5% had PCFS score one, 34.2% patients had PCFS score two, 14.5% patients had PCFS score three, 9.2% patients had PCFS score four.

This study shows 84(87.5%) respondents had a normal HADS-D score, 10(10.4%) had borderline abnormal, and 2(2.1%) had an abnormal HADS-D score. It also shows 81(84.4%) respondents had a normal HADS-A score, 12(12.5%) had borderline abnormal, and 3(3.1%) had an abnormal HADS-A score. Another study conducted by Kong et al.(2020)[19] had the mean score of the anxiety subscale and depression subscale for all patients was 6.35±4.29 and 5.44±4.32, respectively. With the reference to HADS, 50 (34.72%) and 31 (28.47%) participants presented symptoms of anxiety and depression, respectively. Regarding the patients' anxiety levels, it was found that 17.36%, 12.5%, and 4.86% appeared to have mild, moderate, and severe

anxiety, respectively. As for the depression levels of patients, 20 were mildly depressed (13.89%), 15 were moderately depressed (10.42%), and 6 were severely depressed (4.17%), which is closely similar to this study.

This study shows a correlation between VAS prior and VAS after. Out of the 55 cases initially experiencing mild pain before COVID-19, 39 (70.9%) transitioned to moderate pain, while 16 (29.1%) deteriorated to severe pain post-COVID-19 infection. Among 41 cases initially experiencing moderate pain before COVID-19, 13 (31.7%) remained moderate, while 28 (68.3%) cases deteriorated to severe pain after COVID-19 infection. The association was not statistically significant. A significant difference was found in another study which was carried out to examine whether the scores of the participants on the VAS pain scale changed in the 3rd and 4th months from the first measurement (x^2=76.000, $p<0.05$)[20]. When the average of the rows was examined, it was seen that the first measurement score was the highest, while the score decreased in the 3rd month and remained the same in the 4th month, which is not similar to our study.

VAS before COVID-19 score exhibited significant increases in the odds of developing low back pain by 5.250 (95% CI: 2.181-12.635) times ($p< 0.001$). Comorbidity illustrated an increase in the odds of developing low back pain by 3.08 times (95% CI: 0.87-10.83) ($p=0.079$). Marital status was found to increase the chance of developing low back pain with odds of 2.63 (95% CI: 0.264-26.25) ($p< 0.040$). Age, gender, and drug history have no risk of developing low back pain. A study conducted by Du et al.(2019)[21] found that muscle or joint pain exhibited significant increases in the odds of developing low back pain by 4.06 (95% CI: 1.33–12.37) times ($p=0.014$). Age has no risk of developing low back pain, which is similar to our study findings.

Conclusion

A significant increase in low back pain and functional limitations among COVID-19 survivors after COVID-19 period as compared to before the COVID-19 period was observed. So the patients with COVID-19 having low back pain should be treat with care and longtime follow up should be needed.

Declaration

Ethics approval

The study was approved by the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. (Reg. No. 4627, BMU/2023/13172)

Author Contributions:

Conception and development of the idea: SN, AKMA
Writing: SN, MMR
Data analysis: SN, MMK, MSI
Data collection: SN, MMR, AF
Review and Editing: DKB, MMK

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Conflict of interest: None

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