Post COVID Health Problems faced by COVID-19 Infected Healthcare Professionals of a Tertiary Level Hospital

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Abstract

Introduction: COVID-19 is an infectious disease which predominantly affects the lungs but it can also affect other organs such as gastro-intestinal system, brain, heart etc. The substantial proportion of infected people experience mild to moderate symptoms and recover with no after-effects. Some people with COVID-19 can experience long term health problems, known as post-COVID health problems. These are inflammatory or host response towards virus that occurs after four weeks of initial infection and beyond. The aim of this study was to find out the post COVID health problems faced by COVID-19 infected healthcare professionals of a tertiary level hospital.

Methods: This was a descriptive cross-sectional study carried out among healthcare professionals recovered from COVID-19 infection who were selected by using non -probability purposive sampling technique. A semi-structured self-administered questionnaire was used for data collection. The collected data were analyzed by using descriptive and inferential statistics.

Results: Out of 108 healthcare professionals who participated in the study, 42.6% were experiencing various post-COVID health problems. These problems included fatigue (78.3%), persistent cough (54.3%), headache (37%), malaise (34.8%), body ache (32.6%) and others. No significant association of the experience of post-COVID health problems among respondents with their age, sex and COVID-19 vaccination status was revealed at 0.05 level of significance.

Conclusions: A considerable proportion of health professionals are liable to experience various post-COVID health problems after being infected with COVID-19. Their age, sex and COVID-19 vaccination status do not tend to influence on their post-COVID health problems.

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INTRODUCTION

Most of the COVID-19 infected people recover within few weeks of illness but some of them have experienced a variety of mid- and long-term effects after recovery from acute illness which is known as post COVID-19 conditions or long COVID. These people may experience tiredness, dyspnea, fatigue, headache, persistent loss of smell or taste, cough, depression, low-grade fever, muscle pain, and joint pains etc. These consequences are the result of organ damage during acute COVID-19 infection, neurobehavioral abnormalities due to disease process, hospital admission, isolation and societal stigma etc.[1,2] Many studies suggest a higher incidence of COVID-19 infections among healthcare workers. However, information about the long-term complications affecting this population is lacking. The healthcare professionals have been at the forefront of the battle against COVID-19 as they are the front-liners who are directly involved in caring COVID patients. Therefore, they are vulnerable to this highly infectious disease. After being infected with this, most of them may experience post COVID conditions which adversely affects their health and quality of life.[3-5]

The studies of general people reported that considerable number of people with COVID infection suffered from post COVID health problems.[6,7] However, there is limited information on this issue among Nepalese healthcare workers. The aim of this study was to identify the post

COVID-19 health problems faced by COVID-19 infected health care professionals of a tertiary level hospital in Nepal.

METHODS

This was a descriptive cross-sectional study carried out among the health professionals (doctors and nurses) of Shree Birendra Hospital, Chhauni, Kathmandu, Nepal, in February 2022. A non-probability purposive sampling technique was used for the selection of study subjects. The healthcare professionals who were infected with COVID-19 at least six weeks prior to data collection period were included in the study. The sample size was calculated by using Slovin's formula i.e. $n = N/1 + Ne^2$ where, N = Size of the study population (there were in total 345 doctors and nurses meeting the criteria); n = required sample size and e = margin of error (set at 8% i.e., 0.08). Using this formula, the required sample size was 108. A semi-structured self-administered questionnaire which consisted of questions on socio- demographic characteristics and vaccination status, smoking and alcohol habits prior to COVID infection, questions related to COVID-19 infection and post COVID health problems and their lifestyle after COVID-19 infection. The ethical approval for this study was taken from the Institutional Review Committee (IRC) of Nepalese Army Institute of Health Sciences (Ref. 560, February 2022). The permission for data collection was taken from the administration of Shree Birendra Hospital. Written informed consent was taken with each respondent. The respondents were also informed that they would be free to withdraw their participation from the study at any time if they wish. Anonymity was maintained by using serial numbers instead of respondents' names. Data were entered in the Statistical Package for the Social Sciences (SPSS) version 16 software and analyzed by using descriptive statistics i.e. frequency, percentage, mean and standard deviation and inferential statistics i.e. chi-square test.

RESULTS

In this study, 75.9% of respondents were of the age group of ≤ 30 years (Mean age = 28.48 years, SD ± 5.829). Majority of the respondents were females (68.5%) and belonged to Brahmin / Chhetri ethnicity (60.2%). Almost all (95.4%) had completed two doses of COVID-19 vaccine. Among them, 87.4% had Covishield vaccination. In this study, only 3.8% of the respondents had suffered from chronic health problems and they were thyroid problems (75%) and hypertension (25%).

Table 1 shows that majority (68.5%) of the respondents were infected with COVID-19 once whereas 6.5% were infected repeatedly i.e. three or more times. The majority (73.1%) of them had mild symptoms of COVID-19 infection. The duration of illness from COVID-19 was one week among 57.3% respondents whereas among 5.6% respondents it was more than or equal to four weeks.

Table 1. Frequency of COVID-19 Infection, Severity, and Duration of Recovery in the Latest COVID-19 (N = 108)

Variables	No.	Percent
Frequency of infection		
1 time	74	68.5
2 times	27	25.0
≥ 3 times	7	6.5
Severity of latest infection		
Mild	79	73.1
Moderate	26	24.1
Severe	3	2.8
Duration of recovery in latest infection		
1 week	62	57.3
2 weeks	34	31.5
3 weeks	6	5.6
≥ 4 weeks	6	5.6

Regarding the experience of post-COVID health problems, table 2 reveals that 42.6% of the respondents had experienced post-COVID health problems. With regards to the type of health problems, highest proportion (78.3%) of them experienced persistent fatigue followed by chronic cough (54.3%), headache (37%), malaise (34.8%) and body ache (32.6%).

Table 2. Experience of Post-COVID Health Problems

Variables	Number	Percent
Post-COVID health problems experienced (N = 108)		
Yes	46	42.6
No	62	57.4
Type of health problems experienced* (N = 46)		
Fatigue	36	78.3
Chronic cough	25	54.3
Headache	17	37.0
Malaise	16	34.8
Body ache	15	32.6

Shortness of breath	14	30.4
Joint pain	14	30.4
Loss of smell	11	23.9
Loss of taste	11	23.9
Chest pain	8	17.4
Diarrhea	8	17.4
Poor memory and concentration	6	13.0
Mood changes	6	13.0
Weight loss	4	8.7
Dizziness	4	8.7
Persistent fever	3	6.5
Difficulty in sleeping	3	6.5
Anxiety	3	6.5
Repeated disturbing and unwanted thought	1	2.2

* Multiple responses

With regard to the lifestyle following COVID-19 infection, 46.3% of the respondents used to sleep for less than six hours and a similar percentage of respondents used to sleep for six to eight hours at night (Table 3). The majority (69.4%) of the respondents took rest in-between work sometimes, 52.4% used to perform yoga and meditation sometimes and 93.9% of respondents used to perform deep breathing exercise after COVID-19 infection.

Table 3. Lifestyle of respondents after COVID-19 Infection

Variables	No.	Percent
Duration of sleep at night (in hours) (N = 108)		
6 >	50	46.3
8 - 6	50	46.3
8 <	8	7.4
Rest in between work (N = 108)		
Never	28	26.0
Sometimes	75	69.4
Frequently	5	4.6
Frequency of yoga and meditation (N = 21)		
Sometimes	11	52.4
Frequently	7	33.3
Always	3	14.3
Type of breathing exercise (N = 33)		
Deep breathing exercise	31	93.9
Pursed lip breathing exercise	2	6.1

The higher proportion (53.8%) of the respondents belonging to > 30 years age had experienced post-COVID health problems in comparison to ≤ 30 years (39.0%) respondents however this was not statistically significant (Table 4). Likewise in terms of sex of the respondents, the higher proportion of female respondents (48.6%) had experienced post-COVID health problems in comparison to the male respondents (29.4%) but again it was statistically insignificant. No significant association of the experience of post-COVID health problems was seen with marital status of the respondents.

Table 4. Association of experience of Post-COVID health problems with socio-demographic variables (N = 108)

Variables	Experience of post-COVID health problems		Chi-square value	p-value
	No No. (%)	Yes No. (%)		
(Age (in years				
≤ 30	50 (61.0)	32 (39.0)	1.774	0.183
> 30	12 (46.2)	14 (53.8)		
Sex				
Male	24 (70.6)	10 (29.4)	3.526	0.06
Female	38 (51.4)	36 (48.6)		
Marital status				
Married	23 (54.8)	19 (45.2)	0.197	0.657
Unmarried	39 (59.1)	27 (40.9)		

There was no significant association of post-COVID health problems with COVID-19 vaccination status and smoking and alcohol habits (Table 5).

Table 5. Association of Post-COVID Health problems with COVID-19 Vaccination status and smoking and alcohol habits (N = 108)

Variables	Post-COVID health problems		Chi-square value	-p value
	No	Yes		
Completion of vaccine				
Yes	59 (57.3)	44 (42.7)	0.014	1.000#
No	3 (60.0)	2 (40.0)		
Smoking habit				
Yes	6 (66.7)	3 (33.3)	0.344	0.557
No	56 (56.6)	43 (43.4)		
Alcohol habit				
Yes	13 (48.2)	14 (51.9)	1.262	0.261
No	49 (60.5)	32 (39.5)		

#Fisher's Exact Test

DISCUSSION

COVID-19 infection is a complex condition which affects many survivors of COVID-19 infections. Till date, the exact pathology of this disease is poorly understood but it has a huge negative impact on survivor's health and occupation.[8] The post-COVID conditions are found more often in people who had severe COVID-19 illness, but anyone who has been infected with SARS-CoV-2 can experience post-COVID conditions, even people who had mild illness or no symptoms from COVID-19. Few people who had been infected with severe COVID-19 may experience symptoms of multi-organ effects or autoimmune conditions lasting weeks or months.[9] As the population of patients recovering from COVID-19 grows, it is necessary to establish an understanding of the healthcare issues surrounding them.

In the present study, 42.6% of the respondents experienced one or more post-COVID symptoms. This finding is similar to the study conducted among 138 healthcare workers in UK where 45% reported persistent symptoms after COVID-19 infection.[8] Similarly, 46% patients developed post-COVID symptoms in Bangladesh.[10] COVID-19 is recognized as a multi-organ disease with a broad spectrum of manifestations. There are increasing reports of persistent and prolonged effects after acute COVID-19 similar to post-acute viral syndromes described in survivors of other virulent coronavirus epidemics.[11]

As part of post-acute COVID-19 syndrome, dyspnoea and cough were found to remain persistent in most infected people beyond four weeks from the onset of symptoms. The mechanisms of dyspnoea after COVID-19 are multifactorial, including parenchymal sequelae, dysfunctional breathing, cardiovascular dysfunction and muscular deconditioning.[12,13] The present study reveals that more than half of the respondents had chronic cough followed by shortness of breath after COVID-19 infection. This finding is consistent with the study conducted among Wrightington, Wigan and Leigh NHS Teaching Trust (WWL) staff from the UK where 40% experienced mild-to-moderate shortness of breath and moderate-to-severe fatigue (39%).[8] The findings from another study conducted in Sukra Raj Tropical and Infectious Disease Hospital among 118 patients revealed that 40.7% of the post-COVID patients had dyspnea and 27.1% had cough.[5] Cough after COVID-19 was due to activation of the vagal sensory nerves, which leads to a cough hypersensitivity state and to neuro-inflammatory events in the brain.[14]

The corona viruses produce a wide variety of acute CNS symptoms including headaches, cognitive dysfunction, motor difficulties and loss of consciousness.[15] As per Robert Belvis, acute headache during COVID-19 is attributed to systemic viral infection, primary cough headache, tension-type headache and headache attributed to heterophoria; and headache attributed to hypoxia and a new headache can appear if the second phase related to the cytokine storm.[16] In the present study, 37% of respondents experienced headache and 6.5% experienced persistent fever. This was in contrast to the study conducted among Bangladeshi patients where 20% experienced headache and 62% experienced persistent fever.[10] This discrepancy might be due to differences in population and setting of the study.

In the present study, more than two-fifth of respondents experienced loss of smell and loss of taste. This is consistent with a study conducted among 1250 patients in the United States of America, where 13.1% had loss of taste and smell.[17] Another study from Germany among 442 patients also documented that 12.4% respondents experienced loss of smell and loss of taste (11.1%).[18] The exact pathophysiology of olfactory test disorder in patients with COVID-19 remains to be elucidated, but local mucosal inflammation and olfactory epithelial destruction appear to be the main mechanisms.[19,20]

Fatigue may be the most frequent symptom reported by patients after the initial infection in various studies. As cited by Montani et al, fatigue has been reported among 40–70% of patients in all the reported cases during six months of the post-acute phase.[21] The present study also identified that more than three-fourth of the respondents experienced fatigue and very few experienced sleeping difficulties after recovery from COVID-19 infection. This

finding is consistent with the findings of a study from China among 1733 patients where 63% had fatigue and 26% had sleeping difficulties and among 431 patients from Switzerland where 55% experienced fatigue.[4, 22] In the present study, almost one third of the respondents had joint pain and 17.4% had chest pain. This finding is consistent with the study conducted in Italy among 143 patients where 27.3% reported joint pain and 21.7% reported chest pain.[23]

COVID-19 can also generate acute psychiatric consequences and symptoms which can persist over time after the acute phase. The anxiety-provoking social media context, the fear of a serious form of the disease, the fear of not being able to benefit from appropriate care, the lack of established curative treatment, the lack of visits from relatives for hospitalized patients, brain damage caused by the virus itself, and inflammatory and immune imbalance have favored anxiety or depressive symptoms. In the present study also, 13% respondents experienced poor memory and concentration followed by mood changes (13%) and anxiety (6.5%). Similar findings were reported in various studies from different countries.[5, 21]

CONCLUSIONS

Significant number of health professionals are likely to experience various post-COVID health problems. The most common health problems are fatigue, persistent cough, headache, malaise, body ache, shortness of breath and joint pain. Their age, sex, marital status, COVID-19 vaccination status, smoking habits and alcohol intake do not tend to influence on post-COVID health problems.

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