

# Evaluation of Drug Pattern Usage in Post Covid-19 Infection after Apparent Recovery from Disease at A Tertiary Care Teaching Hospital

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## I. Introduction:

Over recent months, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection has been confirmed in millions of people around the world. SARS-CoV-2 infection (COVID-19) is a major pandemic resulting in substantial mortality and morbidity worldwide. Of the individuals affected, about 80% had mild to moderate disease and among those with severe disease, 5% develop critical illness and life threatening sequelae. A few of those who recovered from COVID-19 develop persistent or new symptoms lasting weeks or months; this is called “long COVID”, “Long Haulers” or “Post COVID syndrome” [1].

With the ever-increasing number of post-COVID-19 patients, the new pandemic is the “post-COVID-19 syndrome.” Studies in COVID-19-recovered patients are recognized as an important need of the hour. Even with the initial recovery, it is a battle half won, and often, the post-COVID-19 issues continue to linger [2].

“Post-COVID-19 syndrome” has affected millions of COVID-19-recovered patients, with about 87% of hospitalized patients suffering from it. Even those with mild COVID-19 are suffering from persistent health issues after initial recovery. Healthcare workers who are the frontlines of defense against COVID-19 pandemic have a greater risk of infection, because of frequent and prolonged contact with large numbers of infected patients, lack of availability of personal protective equipment (PPE), inadequate training in infection control on some occasions, and due frequent exposure to unrecognized COVID-19 patients [5]. The Large-scale epidemics pose various challenges to individuals of all ages and cultures, but the emotional stress experienced by frontline health care workers (HCWs) is severe, and can be enduring [3].

The present study highlights the various drug usage types, their pattern of use. This study also highlights the health, social and psychological issues faced by HCW themselves after recovery from COVID-19 Infection.

## II. Methodology:

It is Prospective, observational study. A total 250 Health care worker (HCW) including faculty members, resident doctors, nursing staff and supporting staff of PDU government medical college and hospital, Rajkot were involved in this study. Permission was obtained from institutional ethics committee before the commencement of the study. In this study Data is collected as a structured questionnaire in the format of google form. Health care worker who became COVID-19 positive in between start of pandemic to October 2020 was included in this study. All HCW gave digital informed consent at the start of the questionnaire. Without the informed consent, the remaining questionnaire could not be completed.

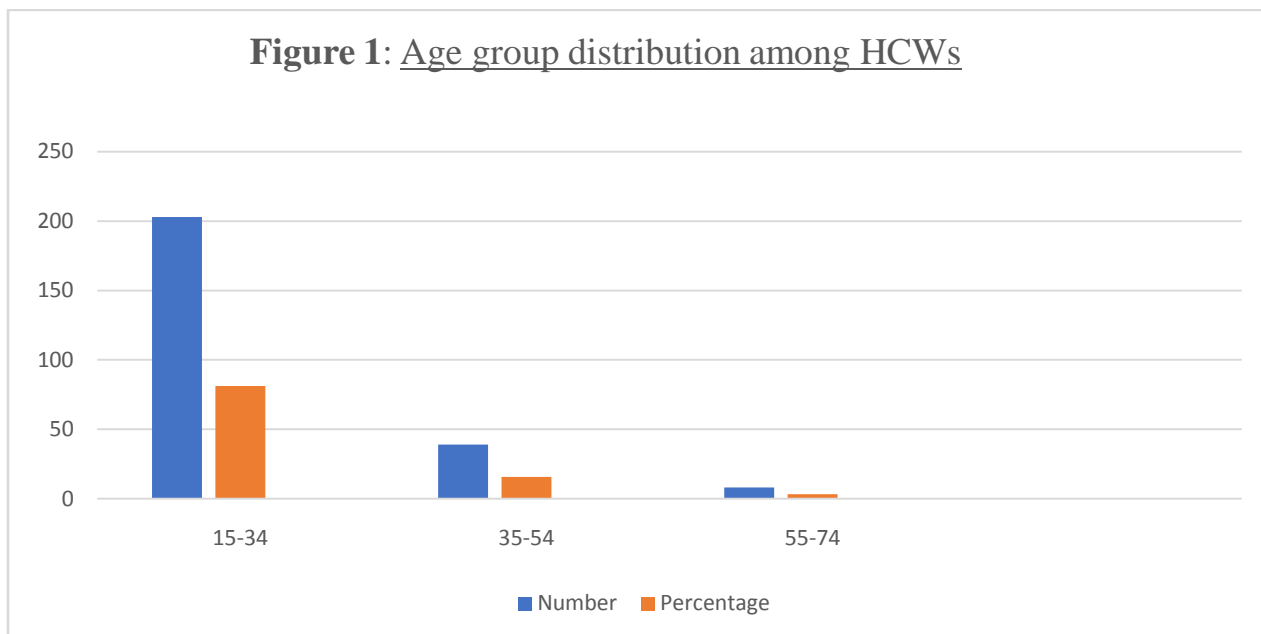
### Selection criteria:

- Inclusion criteria: 1) RT-PCR or Antigen detection test positive HCWs for COVID-19 infection  
2) Age above 18 years and either sex  
3) Given informed consent

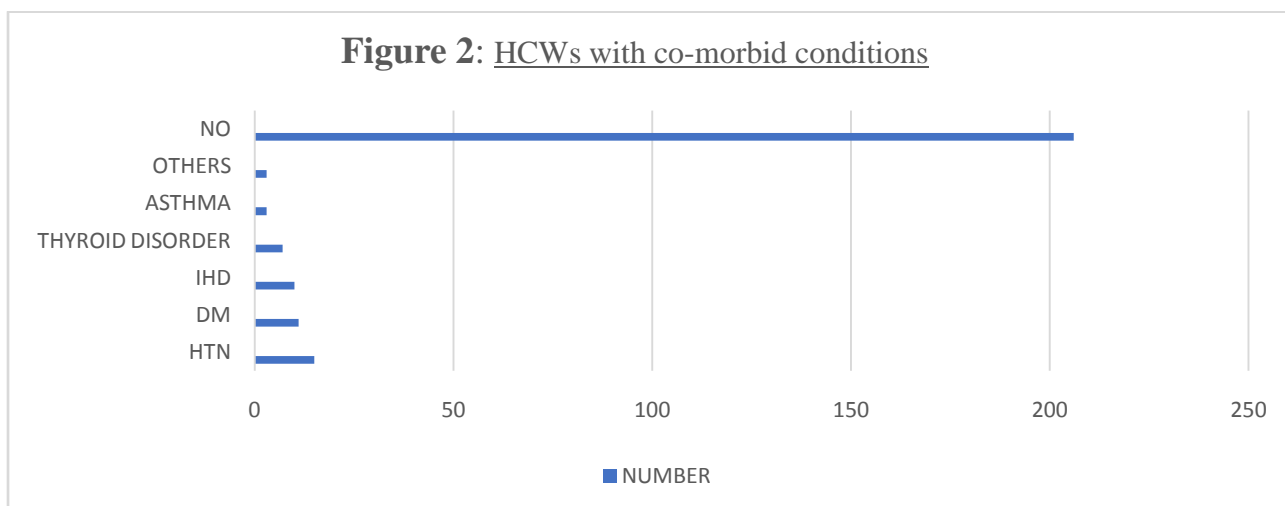
- Exclusion criteria: 1) Unwilling to participate in study were excluded.  
2) Undiagnosed or suspected COVID-19 HCWs with no diagnostic investigation

## III. Result:

Two hundred and fifty HCWs responded to questionnaires made available to them through Google form who had apparently recovered from COVID-19 infection before 6 or more months. Most of healthcare worker were in the age group of 15 to 34 years with the mean age distribution of 29.2 years and age range from 19 to 70 years.



Among total 250 HCWs, 206 (82.4%) had no co-morbidity, while 15 (6%) had HTN, 11 (4%) had DM, 10 (4%) had IHD, and around 1-3% had thyroid and asthma before they infected with COVID-19.

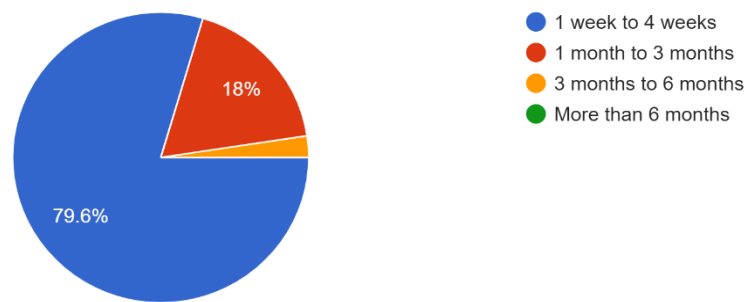


For these co-morbid condition only 16.4% were taking appropriate medication like Antihypertensive- Tab. Telmisartan, Tab. Losartan, Tab. Amlodipine, Tab. Metoprolol and Tab. Nifedipine; Statin like Ecosprin (Aspirin 75); Hypoglycemic drugs like Inj. Wosulin (30% human insulin + 70% isophane), Tab. Metformin and Tab. Glipizide; Drug for hypothyroidism like Tab. Thyroxin and Tab. Levo-thyroxin and 1 HCW was on Tab. Carbimazole for hyperthyroidism and bronchodilator like Salbutamol and Formoterol + Budesonide inhaler FDC. Only 4% had to increase their dose of medication after recovery from COVID-19 infection initially for their co-morbid condition.

Among 250 HCWs, 120 (48%) were diagnosed with RTPCR and 130 (52%) with Rapid Antigen test for COVID-19 infection.

Diagnostic COVID-19 test	Percentage of positivity
RT-PCR	48%
Antigen detection test	52%

Among total of 250, 199 (79.6%) HCWs had apparently recovered from COVID-19 infection between 1 to 4 weeks duration and 6 (2.4%) HCWs had a recovery period of around 3 to 6 months.



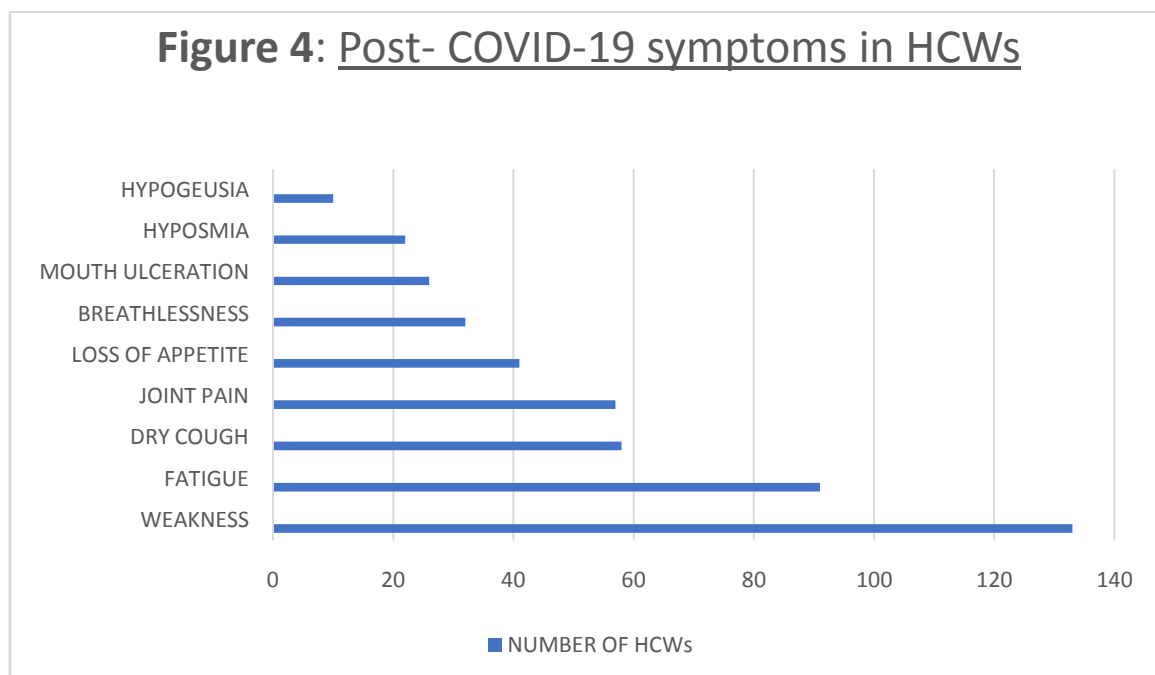
**Figure 3:** Percentage of duration of apparent recovery from COVID-19

After diagnosis 174 (69.6%) HCWs were advised home isolation with oral therapy, 59 (23.6%) HCWs needed hospitalization on room air, 16 (6.4%) HCWs were admitted to hospital with O2 support and 1 (0.4%) HCW was admitted to Intensive care unit (ICU).

After apparent recovery 92 (36.8%) HCWs were suffering from mental disturbances, 67 (26.8%) had social stigma/disruption and 38 (15.8%) had financial loss in form of daily wages or short of leaves.

Loss due to COVID-19 infection	
Mental disturbances	36.8%
Social disruption	15.8%
Financial loss	15.8%

Most common symptom which persisted after initial recovery from COVID-19 infection was weakness in 133 (52.3%) followed by persistent fatigue 91 (36.4%), dry cough 58 (23.2%) and some also had joint pain and loss of appetite.

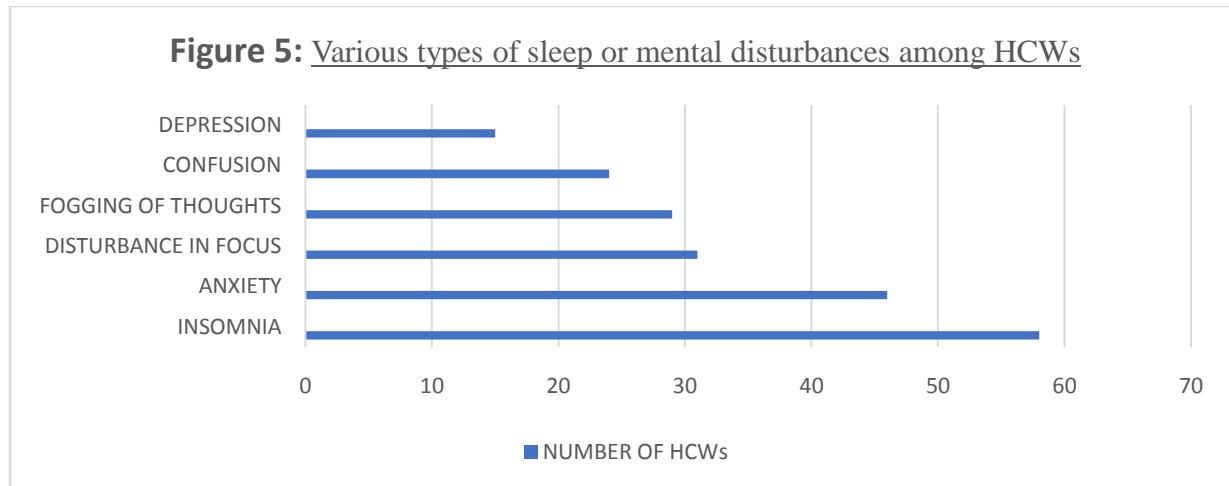


In most of infected HCWs, that is 176(70.4%) these above symptoms persisted for 1 to 4 weeks and 10 (4%) had those symptoms for more than 6 months. To overcome these symptoms 151 (60.4%) HCWs had done nothing, 55 (22%) took self-medications, 47 (18.8%) consulted to doctor and 2 (0.8%) were re-admitted in hospital. Most of HCWs had done some life-style modification like changing food habit, taking rehabilitation session, chest physiotherapy, Yoga and meditation, exercise and taking supplements like Omega-3 and Multivitamins. They

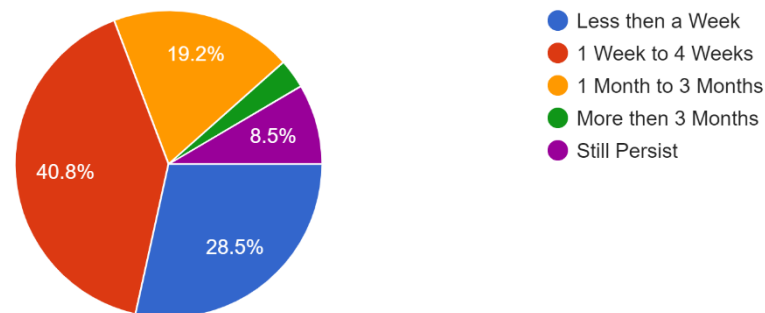
also took self-medication like Tablet Levocetirizine, Tablet Azithromycin, Tablet Doxycycline, Tablet Zinc and Tab. Vit C.

Medications	No. HCWs	Percentage
No action taken	151	60.4%
Self-medication	55	22%
Consulted to doctor	47	18.8%
Re-admitted to hospital	2	0.8%

Among 250 HCWs, 61.2% suffering from one or other type of mental disturbances. Maximum 26% and 20.6% had suffered from insomnia and anxiety respectively and others suffered from disturbance in recent memory and fogging of thoughts.

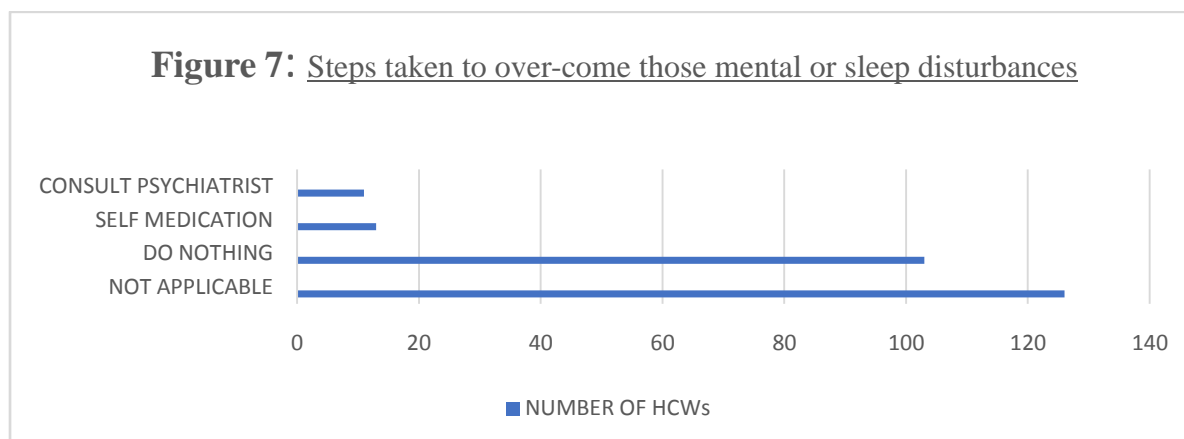


In 28.5% HCWs the psychological symptoms persisted for less than 1 week, 40.8% had these symptoms for 1 to 4 weeks and 4.4% are still battling with those symptoms.



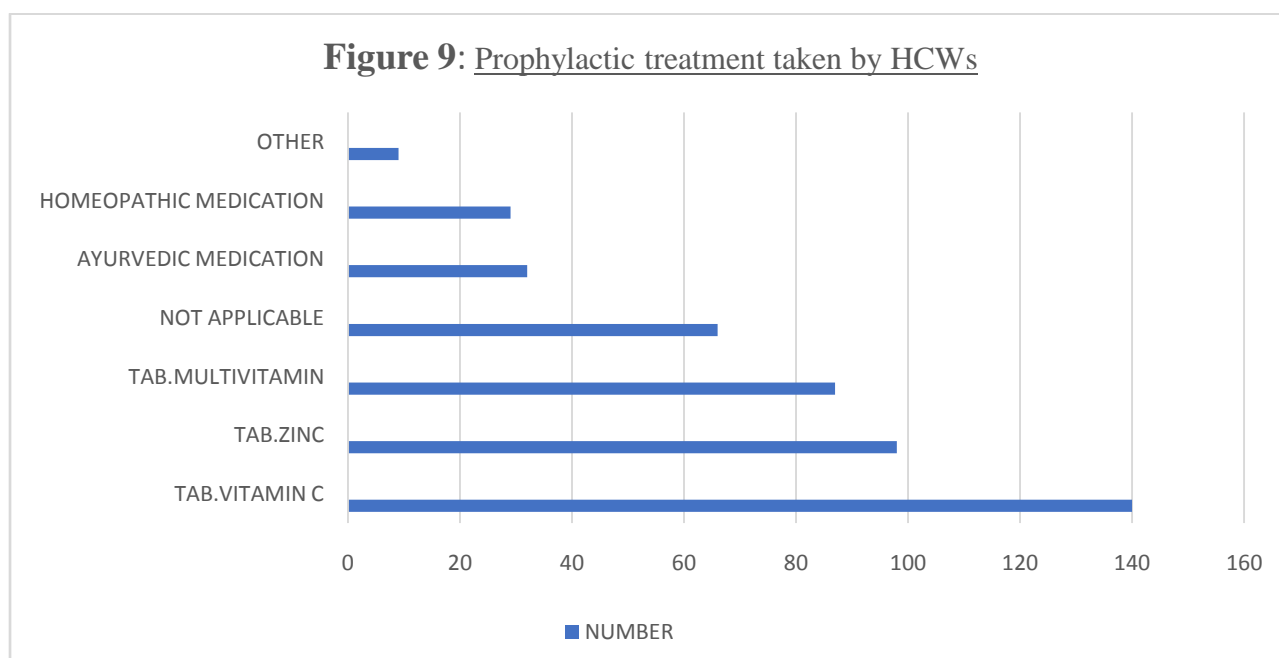
**Figure 6: Duration of sleep or mental disturbances among HCWs**

Of the HCWs with mental/psychiatric disturbances, 5.2% took self-medication including Tab. Olanzapine, Tab Clonazepam and Tab. Fluoxetine and only 4.4% consulted to psychiatrist and 8 participants went through counselling therapy.



13.2% also experienced skin related complication like rash, 4% with itching and 3% had experienced some forms of fungal infection. Among them 8 HCWs had taken antihistamine, 5 HCWs had taken antibiotics and 5 HCWs had taken antifungal agents.

Only 18% HCWs experienced ocular complication in recovery period. 7% had itching and redness, 4% had dryness of eyes. Most commonly Carboxymethylcellulose and ciprofloxacin eye drop were used by them. For prophylaxis of COVID-19, 56 % HCWs had took Tab. Vit C , 39.2% had took Tab. Zinc , 34.8 % had took Tab. Multivitamin and 12.8 % had took Ayurvedic medication.



#### IV. Discussion:

The COVID-19 pandemic has exploded since cases were first reported in China in December 2019. As of October 18, 2021, more than 240 million cases of COVID-19- caused by SARS-CoV-2 infection have been reported globally, including more than 4.9 million deaths [12].

Although COVID-19 is primarily a pulmonary disease, emerging data suggest that it also leads to cardiac, dermatologic, hematologic, hepatic, neurologic, renal, and other complications. Thromboembolic events also occur in patients with COVID-19, with the highest risk occurring in critically ill patients.

WHO clinical case definition of post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS-CoV 2 infection, usually 3 months from the onset of COVID-19, with symptoms that last for at least 2 months and cannot be explained by an alternative diagnosis.

The long-term sequelae of COVID-19 survivors are currently unknown[11].

Currently, remdesivir, an antiviral agent, is the only Food and Drug Administration-approved drug for the treatment of COVID-19 [11].

The WHO treatment guidelines for COVID-19 include humanimmunoglobulin, interferons, chloroquine, hydroxychloroquine, remdesivir, oseltamivir, favipiravir, carrimycin, methylprednisolone, bevacizumab, thalidomide, vitamin C, pirfenidone, bromhexine, fingolimod, danoprevir, ritonavir, darunavir, cobicistat, lopinavir and traditional Chinese medicines (TCM) [10].

At present, there is no known agent that is effective in preventing infection when administered before or after exposure to SARS-CoV-2. Clinical trials are investigating several agents, including emtricitabine plus tenofovir alafenamide or tenofovir disoproxil fumarate, hydroxychloroquine, ivermectin, and supplements such as zinc, vitamin C, and vitamin D. Studies of anti-SARS-CoV-2 monoclonal antibody that target SARS-CoV-2 are also underway [14].

Findings suggest that COVID-19 had a negative effect upon HCWs, especially when younger age group (which suggests less working experience), in frontline, and when involved in the daily care of severely affected patients [2].

In our study most of participants were belongs to younger age group between 22 to 36 years. As various study indicate that Post COVID-19 complications are mostly affecting elderly population above 60 years of age with medical condition[13]. But in our study younger population was also affected by post COVID-19 syndrome. Among them only 17.6% were having one or other co-morbid condition which could further aggravate by COVID-19 infection. According to our study only 4% HCWsincreased dose of their treatment for co-morbid condition after recovery from COVID-19 infection. In **WC et al.** concluded that percentage of patients who died was 12 times higher among those with reported medical conditions (19.5%) than among those without medical conditions(1.6%), and the percentage of those who were hospitalized was six times higher among those with reported medical conditions (45.4%) than among those without medical conditions (7.6%). The mortality rate was highest in those aged >70 years, regardless of the presence of chronic medical conditions. [13].

Regarding duration of apparent recovery from COVID-19 infection, majority of HCWs recovered within 1 to 4 weeks and only few took longer duration around 3 to 6 months for recovery from initial infection.

In our study after diagnosis most of HCWs were advised home isolation with oral treatment due to minor symptoms and appropriate health status, 23.6% were admitted on hospitalon room air, 6.4% were needed O<sub>2</sub>support during hospital stay and only 1 HCW was admitted to ICU. As compare to **Meyerowitz EA et al.2020** in which 14% of patients required hospitalization, 2% were admitted to the intensive care unit, and 5% died [12].

The most common symptoms in post-COVID-19period among HCWs in our studywas Weakness (28.3%), fatigue (19.3%), drycough (12.3%) and joint pain (12%) as compare to **Tawfik et al.** in which the most common symptoms recorded include fatigue, dyspnea, chest pain, etc. Other reported symptoms include myalgia, headache, fever, and palpitations. Serious complications appeared also but were less common, like ventricular dysfunction, pulmonary function abnormalities, acute kidney injury, cognitive impairment, depression, and anxiety [14].

In most of infected HCWs, that is 176(70.4%) this above symptoms persisted for 1 to 4 weeks and 10 (4%)had those symptoms for more than 6 months. It may affecttheir routine activity as well as mental health.

To overcome the symptoms 151 (60.4%) HCWs had done nothing, 55 (22%) took self-medications like Tablet Levocetirizine, Tablet Azithromycin, Tablet Doxycycline, 47 (18.8%) consulted to doctor and 2 (0.8%) were re-admitted in hospital. Consumption of antibiotic and other symptomatic treatment among HCWs was more as compare to other patient due to medical knowledge.

Most of HCWs had done some life-style modification like changing food habit, taking rehabilitation session, chest physiotherapy, Yoga and meditation, exercise and taking supplements like Omega-3 and Multivitamins.

Among 250 HCWs, 61.2% suffering from one or other type of mental disturbances. Maximum had suffered from insomnia and anxiety and others suffered from disturbance in recent memory and fogging of thoughts. Among them only 4.4% consulted to psychiatrist and 8 participants went through counselling therapy. Several studies highlighthow HCWs are not always ready to ask for help, especially for psychologicaland mental support. The reasons for this can vary. Psychologicalhelp still gathers some form of diffidence, prejudice and shame, evenamong highly educated people who may be more aware of these emotions, but who have equally internalized them and still consider them impacting other people's behavior rather than their own [16].

13.2% also experienced skin related complication like rash, 4% with itching and 3% had experienced some forms of fungal infection. Among them 8 HCWs had taken antihistamine, 5 HCWs had taken antibiotics and 5 HCWs had taken antifungal agents. **M. Sachdeva et al** study finding suggesting that it was found that most cutaneous presentations were erythematous rash (77.8% or 14/18) with few cases of urticaria (16.7% or 3/18) and vesicle formation (5.6% or 1/18). These findings reflect a similar distribution of cutaneous manifestations as seen in our review. It is still unclear whether cutaneous symptoms are a secondary consequence of respiratory-related infection or a primary infection of the skin itself [17].

18% HCWs experienced ocular complication in this study. 7% had itching and redness, 4% had dryness of eyes. Most commonly Carboxymethylcellulose and ciprofloxacin eye drop were used by them.

For prophylaxis of COVID-19, 56 % HCWs had taken Tab. Vit C, 39.2% had taken Tab. Zinc, 34.8 % had taken Tab. Multivitamin and 12.8 % had taken Ayurvedic medication.

Currently, there are no proven prophylactic or therapeutic intervention for management of COVID-19. Some therapeutic agents are used off-label, alone or in combination, but we need further experimental data and validation to achieve gold-standard therapeutic regimen with the highest possible efficacy and low side effects [19].

Currently, there is no long term evidence to help determine how long the ongoing effects currently seen after a SARS-CoV-2

Our knowledge of post-COVID-19 remains in its infancy, with an urgent need to understand its etiology and treatment [8].

## V. Conclusions:

Persistence of various symptoms in people who recovered from COVID-19 including HCWs is a major health issue worldwide. It could be due to various mechanisms such as post-intensive care syndrome, post-viral fatigue syndrome, permanent organ damage or others. Proper clinical evaluation will help identify the etiology, and to customize treatment. As the disease is new, it is too early to know the true long-term outlook. PCS is independent of severity of acute illness and humoral response. Future studies should evaluate the mechanisms by which SARS-CoV-2 may cause PCS and the best therapeutic options.

## References:

- [1]. Sharmin E, Begum S, Afreen S, Islam D, Ahmed SF. Drug used pattern by self-medication among the RT-PCR positive health workers in Dhaka city. *Int J Basic Clin Pharmacol* 2021;10:1049-55.
- [2]. Rao S, Amara V, Chaudhuri S, Rao BK, Todur P. "Post-COVID-19 syndrome:" The new pandemic affecting healthcare workers and how the frontline warriors are battling it. *Indian J Palliat Care* 2021;27(2):313-8.
- [3]. Sunil R, Bhatt MT, Bhumika TV, Thomas N, Puranik A, Chaudhuri S, et al. Weathering the Storm: Psychological Impact of COVID-19 Pandemic on Clinical and Nonclinical Healthcare Workers in India. *Indian J Crit Care Med* 2021;25(1):16–20.
- [4]. *BMJ* 2020; 370 doi: <https://doi.org/10.1136/bmj.m3565> (Published 15 September 2020) Cite this as: *BMJ* 2020;370:m3565
- [5]. Tawfik HM, Shaaban HM, Tawfik AM. Post-COVID-19 Syndrome in Egyptian Healthcare Staff: Highlighting the Carers' Sufferings. *Electron J Gen Med* 2021;18(3):em291. <https://doi.org/10.29333/ejgm/10838>
- [6]. Halpin SJ, McIvor C, Whyatt G, et al. Post-discharge symptoms and rehabilitation need in survivors of COVID-19 infection: a cross-sectional evaluation. *J Med Virol* 2021;93:1013–1022.
- [7]. T A-Z K Gaber, A Ashish, and A Unsworth. Persistent post-covid symptoms in healthcare workers occupational med (Iod) 2021 Apr 8. doi: **10.1093/occmed/kqab043**
- [8]. Pereira C, Harris BHL, Di Giovannantonio M, et al. Antibody response to SARS-CoV -2 infection is not associated with post-COVID-19 syndrome in healthcare workers. *J Infect Dis*. Published online March 2, 2021. Doi:10.1093/infdis/jiab120
- [9]. COVID-19 rapid guideline: managing the long-term effects of COVID-19 (NG188) (<https://www.nice.org.uk/terms-and-conditions>)
- [10]. *Rev Panam Salud Publica* 44, 2020 | [www.paho.org/journal](http://www.paho.org/journal) <https://doi.org/10.26633/RPSP.2020.40>
- [11]. COVID-19 Treatment Guidelines Panel. Coronavirus Disease 2019 (COVID-19) Treatment Guidelines. National Institutes of Health. Available at <https://www.covid19treatmentguidelines.nih.gov/>
- [12]. Meyerowitz EA, Kim AY, Ard KL, et al. Disproportionate burden of coronavirus disease 2019 among racial minorities and those in congregate settings among a large cohort of people with HIV. *AIDS*. 2020;34(12):1781- 1787. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/32604138>.
- [13]. Wu C, Chen X, Cai Y, et al. Risk factors associated with acute respiratory distress syndrome and death in patients with coronavirus disease 2019 pneumonia in Wuhan, China. *JAMA Intern Med*. 2020;180(7):934-943. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/32167524>.
- [14]. A.V. Raveendran, R. Jayadevan and S. Sashidharan. Diabetes & Metabolic Syndrome: Clinical Research & Reviews 15 (2021) 869-875
- [15]. Tawfik HM, Shaaban HM, Tawfik AM. Post-COVID-19 Syndrome in Egyptian Healthcare Staff: Highlighting the Carers' Sufferings. *Electron J Gen Med*. 2021;18(3):em291. <https://doi.org/10.29333/ejgm/10838>
- [16]. Georgia Zara, Michele Settanni, Marco Zuffranieri, Sara Veggi, Lorys Castelli. *Journal of Affective Disorders* 294 (2021) 220–226 <https://doi.org/10.1016/j.jad.2021.07.056>
- [17]. Muskaan Sachdeva, Raffaele Gianotti, Monica Shah, Lucia Bradanini, Diego Tosi, Stefano Veraldi et al. Cutaneous manifestations of COVID-19: Report of three cases and a review of literature 0923-1811/ © 2020 Japanese Society for Investigative Dermatology. Published by Elsevier B.V. <https://doi.org/10.1016/j.jdermsci.2020.04.011>
- [18]. Juan-Manuel Anaya, Manuel Rojas, Martha L. Salinas, Yhojan Rodríguez, Geraldine Roa, Marcela Lozano et al. Post-COVID syndrome. A case series and comprehensive review. *Post-COVID syndrome. Autoimmunity Reviews* 20 (2021) 102947 <https://doi.org/10.1016/j.autrev.2021.102947>
- [19]. Adeleh Saheb Nasagh a, Fatemeh Saghafi b, Razieh Avan c, Amirhosein Khoshi d, Masoud Khataminia e, Mohammadreza Safdari f et al. The prophylaxis and treatment potential of supplements for COVID-19 *European Journal of Pharmacology* 887 (2020) 173530 <https://doi.org/10.1016/j.ejphar.2020.173530>