FACTORS THAT DELAY RETURN TO WORK OF COVID-19 POSITIVE HEALTH CARE WORKERS AT KSMC, MARCH-AUGUST 2020

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ABSTRACT

This study about Factors that delay return to work of COVID-19 positive health care workers at King Saud medical city Riyadh Saudi Arabia 2020. Coronaviruses (CoV) are a large family of RNA viruses that cause illnesses ranging from the common cold to more severe diseases such as Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV).

The aim of this study is to determine the factors that delay return to work among COVID-19 positive HCPs and to study the relationship of the associated risk factors and the delay in return to work among positive COVID-19 HCPs and to minimize the delay in return to work among COVID-19 positive HCPs which will maintain staffing levels to provide adequate care to all patients. Health care professional is defined as all staff in the health care facility involved in the provision of care for a COVID-19 infected patient, including those who have been present in the same area as the patient, as well as those who may not have provided direct care to the patient, but who have had contact with the patient's body fluids, potentially contaminated items or environmental surfaces.

Sampling method: The design of the sampling for this study will be Stratified Random Sampling (SRS) cross section study. This study about Factors that delay return to work of COVID-19 positive health care workers at King Saud medical city Riyadh Saudi Arabia mc 2020. Coronaviruses (CoV) are a large family of RNA viruses that cause illnesses ranging from the common cold to more severe diseases such as Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV).

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1. INTRODUCTION

Coronaviruses (CoV) are a large family of RNA viruses that cause illnesses ranging from common cold to more severe diseases such as Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV). The new strain of coronavirus was identified in December 2019 in Wuhan city, Hubei province of China, and has been named by the international...
committee on taxonomy of viruses (ICTV) as severe acute respiratory syndrome corona virus-2 (SARS-CoV-2). The ICTV have determined that SARS-COV-2 is the same species as SARS-CoV but a different strain. The world health organization (WHO) has named the disease associated with SARS COV-2 infections as corona “Covid-19”. Since the emergence of the 2019 novel coronavirus (2019-NCOV) infection in WUHAN, china, in December 2019, it has rapidly spread across china and more than 162 other countries. According to the WHO, as at the first of MAY, 2020, there have been more than 5 million confirmed cases of Covid-19 worldwide. Most of the cases involved in the first cluster in December 2019 was linked to the large Wuhan seafood market. (Tenforde et al. (2020))

Health-care professionals are crucial to any health-care system. During the ongoing covid-19 pandemic, health-care professionals are at a substantially increased risk of becoming infected with covid-19 infection. An adequate level and number of staffing is crucial to maintain patient care during the ongoing covid-19 pandemic. (Mohanty et al. (2019))

One of the greatest risks to the health-care system is the high rate of covid-19 infections among health-care workers and the consequent shortage of sufficient number of staff due to delay of return to work, which may affect the service care delivery adequately. (Fragala et al. (2021))

The main factors which may influence the return to work among HCWS with positive covid-19 are: age, gender, work criteria, the presence of symptoms, status at the time of disease identification, the presence of pre-existing disease and the behavior of the HCW toward the disease. (Nabe-Nielsen et al. (2021))

Symptoms of covid-19 should be prioritized for viral testing with approved nucleic acid or antigen detection assays. When a clinician decides that testing a person for SARS-COV-2 is indicated, negative results from at least one FDA emergency use authorized covid-19 molecular viral assay for detection of sars-cov-2 RNA indicates that the person most likely does not have an active sars-cov-2 infection at the time the sample was collected. A second test for SARS-COV-2 RNA may be performed at the discretion of the evaluating healthcare provider, particularly when a higher level of clinical suspicion for SARS-COV-2 infection exists. For HCP who were suspected of having Covid-19 and had it ruled out, either with at least one negative test or a clinical decision that Covid-19 is not suspected and testing is not indicated, then return to work decisions should be based on their other suspected or confirmed diagnoses. (Tolossa et al. (2021))

Symptom-based strategy for determining when HCP can return to work:

HCP with mild to moderate illness who are not severely immunocompromised:
- At least 10 days have passed since symptoms first appeared and
- At least 24 hours have passed since last fever without the use of fever-reducing medications and
- Symptoms (e.g., cough, shortness of breath) have improved.

**Note:** HCP who are not severely immunocompromised and were asymptomatic throughout their infection may return to work when at least 10 days have passed since the date of their first positive viral diagnostic test. (Organization (2020))

HCP with severe to critical illness or who are immunocompromised:
- At least 10 days and up to 20 days have passed since symptoms first appeared
At least 24 hours have passed since last fever without the use of fever-reducing medications and
Symptoms (e.g., cough, shortness of breath) have improved
Consider consultation with infection control experts.

Note: HCP who are severely immunocompromised but who were asymptomatic throughout their infection may return to work when at least 10 days and up to 20 days have passed since the date of their first positive viral diagnostic test.

Health care professional is defined as all staff in the health care facility involved in the provision of care for a covid19 infected patient, including those who have been present in the same area as the patient, as well as those who may not have provided direct care to the patient, but who have had contact with the patient’s body fluids, potentially contaminated items or environmental surfaces. This includes health care professionals, allied health workers, auxiliary health workers (e.g. cleaning and laundry personnel, x-ray physicians and technicians, clerks, phlebotomists, respiratory therapist, nutritionists, social workers, physical therapists, lab personnel, cleaners, admission/reception clerks, patient transporters, catering staff etc.). Contact tracing: healthcare facilities should identify and trace all health care workers who had risk of exposure with confirmed covid-19 patients according to risk classification low and high. (Weerahandi et al. (2020))

General objectives
- To determine the factors that delay return to work of COVID-19 positive HCWs at KSMC March to August 2020
- To estimate the return to work interval among COVID-19 positive HCWs at KSMC during the period between March to August 2020
- To study the relationship of the associated risk factors and the delay in return to work among positive COVID-19 HCWs.
- To minimize the delay in return to work among COVID-19 positive HCWs at KSMC during the period between March to August ...

2. METHODS
2.1. SAMPLING METHOD
The design of the sampling for this study will be Stratified Random Sampling (StRS) cross section study.

2.2. STUDY AREA
KSMC: a tertiary care center for medicine and surgery and is an international recognized center for training in medicine and surgery with bed capacity of 1500 beds.

Sample:
Inclusion criteria:
Mild to moderate cases.
Exclusion criteria:
Patients with severe to critical illness.
Pregnant female staff
Exclusion criteria:
Patients with severe to critical illness.
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Statistical analysis
Descriptive analysis is carried out in the form of frequencies and percentages of sociodemographic characteristics and other variables. The association between delayed return to work and other factors including socio-demographic and personal factors is assessed using Chi-square test for the bivariate analysis and multiple logistic regression for the multivariable analysis. IBM SPSS software version 26 was used for the statistical analysis and a p-value of < 0.05 is considered statistically significant.

| Table 1: Characteristics of participants | Frequency | Percent |
|-----------------------------------------|-----------|---------|
| Gender                                  |           |         |
| Male                                    | 230       | 50.3    |
| Female                                  | 227       | 20      |
| Age                                     |           |         |
| 20-30 years                             | 90        | 16.2    |
| 31-40 years                             | 73        | 25.5    |
| 41-50 years                             | 115       | 31.9    |
| 51-60 years                             | 144       | 6.4     |
| Above 60 years                          | 29        | 20      |
| Nationality                             |           |         |
| Saudi                                   | 216       | 47.6    |
| Non-Saudi                               | 238       | 52.4    |
| Job title                               |           |         |
| Physician                               | 96        | 21      |
| Nurse                                   | 267       | 58.4    |
| Technician                              | 35        | 7.7     |
| Administration                          | 45        | 9.8     |
| Supportive services                     | 14        | 3.1     |
| Work criteria during the COVID19 pandemic 14 days before your positive result |           |         |
| Front line health care worker           | 188       | 41.1    |
| None front line health care worker      | 156       | 34.1    |
| Both                                    | 113       | 24.7    |
| Risk category of your work area         |           |         |
| High risk area                          | 60        | 13.1    |
| Not high-risk area                      | 206       | 45.1    |
| Both areas                              | 191       | 41.8    |
| If you are working in high risk area did you jointed the work after negative result |           |         |
| Yes                                     | 81        | 17.7    |
| No                                      | 190       | 41.6    |
| Nothing                                 | 186       | 40.7    |
| Question                                                                 | Response   | Frequency | Percentage |
|-------------------------------------------------------------------------|------------|-----------|------------|
| How was your health status at the time of diagnosis                     | Stable     | 185       | 40.5       |
|                                                                         | Sick       | 233       | 51         |
|                                                                         | Don’t      | 39        | 8.5        |
|                                                                          | remember   |           |            |
| What were the presenting symptoms of the disease?                       | Fever      | 129       | 28.2       |
|                                                                         | Respiratory symptoms | 112       | 24.5       |
|                                                                         | Diarrhea   | 106       | 23.2       |
|                                                                         | Headache   | 164       | 35.9       |
|                                                                         | Fatigue    | 317       | 69.4       |
|                                                                          | Loss of smell and taste | 209       | 45.7       |
| How was the severity of your symptoms during the illness?              | Mild       | 164       | 36         |
|                                                                         | Moderate   | 151       | 33.1       |
|                                                                         | Severe     | 120       | 26.3       |
|                                                                         | Critical   | 21        | 4.6        |
|                                                                          | Only self- isolation | 181       | 39.6       |
| What type of medical action you received                                | Self-isolation and treatment | 189       | 41.4       |
|                                                                         | Hospital admission | 87        | 19         |
| When did your respiratory symptoms and/or diarrhea resolve?            | Within 10 days from the date of positive swab | 193       | 42.2       |
|                                                                         | Within 10-14 days from the date of positive swab | 218       | 47.7       |
|                                                                         | Within more than 14 days from the result of positive swab | 46        | 10.1       |
| Do you have any history of specific disease or chronic illness?         | Yes        | 265       | 58         |
|                                                                         | No         | 192       | 42         |
|                                                                         | Heart disease | 86       | 18.8       |
|                                                                         | Respiratory disease | 139       | 30.4       |
|                                                                         | Diabetes mellitus | 52       | 11.4       |
|                                                                         | Cancer     | 1         | 0.2        |
| Are you on specific medications or treatments                           | Yes        | 21        | 4.6        |
|                                                                         | No         | 436       | 95.4       |
|                                                                         | Steroids   | 0         | 0          |
|                                                                         | Chemotherapy | 1        | 0.2        |
|                                                                         | Radiation therapy | 0       | 0          |
### Immuno suppressant medication

| Status                  | Count | Percentage |
|-------------------------|-------|------------|
| Sick                    | 140   | 30.6       |
| Stable                  | 122   | 26.7       |
| Little symptoms         | 195   | 42.7       |

### How was your health status when the recovery team contacted you at day 8?

| Status        | Count | Percentage |
|---------------|-------|------------|
| Sick          | 140   | 30.6       |
| Stable        | 122   | 26.7       |
| Little symptoms | 195   | 42.7       |

### Did you receive health education when you are at home isolation?

| Status        | Count | Percentage |
|---------------|-------|------------|
| Yes           | 426   | 94.7       |
| No            | 23    | 5.1        |
| Nothing       | 1     | 0.2        |

### When did you join to work?

| Interval                   | Count | Percentage |
|----------------------------|-------|------------|
| After 10 from first result positive | 82    | 17.9       |
| After 14 from first result positive | 145   | 31.7       |
| More than 14 days from first result positive | 230   | 50.3       |

### Table 2: Association between different factors and delayed return to work

| Factor                  | Gender Male | Gender Female | P-value |
|-------------------------|-------------|---------------|---------|
|                         | N           | N             |         |
|                         | %           | %             |         |
| Gender                  | Male        | Female        |         |
|                         | 113         | 117           | 0.816   |
|                         | 49.10%      | 50.90%        |         |
| Age                     | 20-30 years |               | <0.001  |
|                         | 34          | 56            |         |
|                         | 37.80%      | 62.20%        |         |
|                         | 31          |               |         |
|                         | 42.50%      | 42.50%        |         |
|                         | 58          | 57            |         |
|                         | 50.40%      | 49.60%        |         |
|                         | 66          | 78            |         |
|                         | 45.80%      | 54.20%        |         |
| Nationality             | Saudi       | Non-Saudi     |         |
|                         | 103         | 113           | 0.447   |
|                         | 47.70%      | 52.30%        |         |
|                         | 122         | 116           |         |
|                         | 51.30%      | 48.70%        |         |
| Job title               | Physician   |               | <0.001  |
|                         | 31          | 65            |         |
|                         | 32.30%      | 67.70%        |         |
### Factors That Delay Return to Work of Covid-19 Positive Health Care Workers at Ksmc, March- August 2020

| Category                        | N  | %      |                 |                   |
|---------------------------------|----|--------|-----------------|-------------------|
| Nurse                           | 137| 51.30% | 48.70%          |                   |
| Technician                      | 24 | 68.60% | 31.40%          |                   |
| Administration                  | 23 | 51.10% | 48.90%          |                   |
| Supportive services             | 12 | 85.70% | 14.30%          |                   |
| **Work criteria during the COVID-19 pandemic 14 days before your positive result** |     |        |                 |                   |
| Front line health care worker   | 113| 60.10% | 39.90%          | <0.001            |
| None front line healthcare worker | 77 | 49.40% | 50.60%          |                   |
| Both                            | 37 | 32.70% | 67.30%          | 0.051             |
| **Risk category of your work area** |     | 35.00% | 65.00%          |                   |
| Not high-risk area              | 107| 51.90% | 48.10%          |                   |
| Both areas                      | 99 | 51.80% | 48.20%          |                   |
| **How was your health status at the time of diagnosis?** |     | 41.60% | 58.40%          |                   |
| Stable                          | 77 | 41.60% | 58.40%          |                   |
| Sick                            | 124| 53.20% | 46.80%          |                   |
| **How was the severity of your symptoms during the illness?** |     | 40.20% | 59.80%          |                   |
| Mild                            | 66 | 40.20% | 59.80%          |                   |
| Moderate                        | 77 | 51.00% | 49.00%          |                   |
| Severe                          | 71 | 59.20% | 40.80%          |                   |
| Critical                        | 13 | 61.90% | 38.10%          |                   |
| **What type of medical action you received?** |     | 54.10% | 45.90%          |                   |
| Only self-isolation             | 98 | 54.10% | 45.90%          |                   |
| Table: Factors Associated with Delayed Return to Work |
|-----------------------------------------------------|
| **Self-isolation and treatment**                      |
| N          | 90 | 99 |
| %          | 47.60% | 52.40% |
| **Hospital admission**                                |
| N          | 39 | 48 |
| %          | 44.80% | 55.20% |
| **When did your respiratory symptoms and/or diarrhea resolve?** |
| Within 10 days from the date of positive swab         |
| N          | 137 | 56 | <0.001 |
| %          | 71.00% | 29.00% |
| Within 10-14 days from the date of positive swab      |
| N          | 71 | 147 |
| %          | 32.60% | 67.40% |
| Within more than 14 days from the result of positive swab |
| N          | 19 | 27 |
| %          | 41.30% | 58.70% |
| **Do you have any history of specific disease or chronic illness?** |
| Yes        | N 65 | 200 | <0.001 |
| %          | 24.50% | 75.50% |
| No         | N 162 | 30 |
| %          | 84.40% | 15.60% |
| **How was your health status when the recovery team contacted you at day 8?** |
| Sick       | N 45 | 95 | <0.001 |
| %          | 32.10% | 67.90% |
| Stable     | N 82 | 40 |
| %          | 67.20% | 32.80% |
| Little symptoms | N 100 | 95 |
| %          | 51.30% | 48.70% |
| **Did you receive health education when you are at home isolation?** |
| Yes        | N 207 | 219 | 0.006 |
| %          | 48.60% | 51.40% |
| No         | N 18 | 5 |
| %          | 78.30% | 21.70% |

The association between different factors and delayed return to work was done using Chi-square test. The variables that showed a statistically significant association were Age, job title, work criteria during the COVID-19 pandemic 14 days before the positive result, health status at the time of diagnosis, the severity of symptoms during the illness, time when respiratory symptoms and/or diarrhea resolved, history of specific disease or chronic illness, health status when contacted by the recovery team contacted you at day 8, and receiving health education when were at home isolation.
Table 3 Multiple logistic regression for the association between different factors and the delayed return to work

|                           | OR   | P-value | 95% C.I. for OR |
|---------------------------|------|---------|-----------------|
| **Gender (Female)**       | 1.24 | 0.623   | 0.53 2.88       |
| **Age**                   |      |         |                 |
| 20-30 years               | REF  |         |                 |
| 31-40 years               | 6.14 | 0.008   | 1.61 23.43      |
| 41-50 years               | 3.87 | 0.038   | 1.08 13.88      |
| 51-60 years               | 2.29 | 0.233   | 0.59 8.97       |
| Above 60 years            | 0.42 | 0.437   | 0.05 3.75       |
| **Nationality (Non Saudi)**| 0.11 | <0.001 | 0.04 0.33       |
| **Job title**             |      |         |                 |
| Physician                 | REF  |         |                 |
| Nurse                     | 0.44 | 0.268   | 0.1 1.9        |
| Technician                | 0.08 | 0.028   | 0.01 0.76      |
| Administration            | 0.29 | 0.139   | 0.06 1.5       |
| Supportive services       | 0.06 | 0.066   | 0 1.19         |
| Work criteria during the COVID-19 pandemic 14 days before your positive result | | | |
| Front line health care worker | REF | | |
| None front line healthcare worker | 6.34 | 0.002 | 1.95 20.57 |
| Both                      | 9.64 | 0.003   | 2.11 44.02     |
| **Risk category of your work area** | | | |
| High risk area            | REF  |         |                 |
| Not high-risk area        | 0.12 | 0.028   | 0.02 0.79      |
| Both areas                | 0    | <0.001  | 0 0.08         |
| How was your health status at the time of diagnosis (stable) | 0.27 | 0.032  | 0.08 0.89 |
| How was the severity of your symptoms during the illness? | | | |
| Mild                      |      |         |                 |
| Moderate                  | 1.3  | 0.768   | 0.23 7.38       |
| Severe                    | 1.5  | 0.71    | 0.17 12.93      |
| Critical                  | 0.58 | 0.579   | 0.09 3.94       |
| What type of medical action you received? | | | |
The variables that showed statistical significance were age, nationality, job title, work criteria during the COVID-19 pandemic 14 days before your positive result, risk category of work area, health status at the time of diagnosis, time respiratory symptoms and/or diarrhea resolve, history of specific disease or chronic illness, and receiving health education when were at home isolation.

Those with age between 31-40 years have higher odds of being delayed to work return as compared to those with age 20-30 years (OR=6.14, 95% C.I: 1.61, 23.43). Those with age between 41-50 years have higher odds of being delayed to work as compared to those with age 20-30 years (OR=3.87, 95% C.I: 1.08, 13.88).

Non-Saudis had lower odds of being delayed to return to work as compared to the Saudis (OR=0.11, 95% C.I: 0.04, 0.33).

Technicians had lower odds of being delayed to return to work as compared to the physicians (OR=0.08, 95% C.I: 0.01, 0.76).

Non front line healthcare workers have higher odds of being delayed to work as compared to the front line health care workers (OR=6.34, 95% C.I: 1.95, 20.57). Those who are both front line and non front line healthcare workers have higher odds of being delayed to work as compared to the front line health care workers (OR=9.64, 95% C.I: 2.11, 44.02).

**Not high-risk area**

Those working in non high-risk area had lower odds of being delayed to return to work as compared to the those working in high risk areas (OR=0.12, 95% C.I: 0.02, 0.79). Those working in both high and low risk areas had lower odds of being
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delayed to return to work as compared to the those working in high risk areas (OR=0.004, 95% C.I: <0.001, 0.08).

Those with stable health status at the time of diagnosis have lower odds of being delayed as compared to those who were sick (OR=0.27, 95% C.I: 0.08, 0.89).

Those whose respiratory symptoms and/or diarrhea resolved within 10-14 days from the date of positive had higher odds of being delayed as compared to those who resolved within 10 days from the date of positive swab (OR= 94.12, 95% C.I: 15.08, 587.30). Those whose respiratory symptoms and/or diarrhea resolved within more than 14 days from the result of positive swab had higher odds of being delayed as compared to those who resolved within 10 days from the date of positive swab (OR= 18.11, 95% C.I: 3.12, 105.04).

Those who had any history of specific disease or chronic illness had higher odds of being delayed as compared to those who do not (OR= 37.76, 95% C.I: 12.85, 111).

Those who received health education when were at home isolation had higher odds of being delayed as compared to those who did not (OR= 144.11, 95% C.I: 7.75, 2680.7).

3. DISCUSSION

In our study, we studied several factors that may delay return to work of COVID-19 positive HCWs and found that there was a statistically significant association between age, job title, work criteria during the COVID-19 pandemic 14 days before the positive result, health status at the time of diagnosis, the severity of symptoms during the illness, time when respiratory symptoms and/or diarrhea resolved, history of a specific disease or chronic illness, health status when contacted by the recovery team contacted you at day 8, and receiving health education when at home isolation.

A study reported that not returning to usual health within 2–3 weeks of testing by approximately one-third of respondents. Even among young adults aged 18–34 years with no chronic medical conditions, nearly one in five reported that they had not returned to their usual state of health 14–21 days after testing (Tenforde et al. (2020)).

Regarding gender and nationality, we did not find any statistical significance in delaying return to work which is supported by a study done by Tenforde et al. who did not find an association between race/ethnicity and return to usual health although the modest number of respondents might have limited our ability to detect associations. Also in their study, there was no association between sex and return to work with a p-value more than 0.05 (Tenforde et al. (2020)).

About age, in our study, we found a high statistical significance between age and delay return to work and those with age between 31-40 years and between 41-50 years have higher odds of being delayed to work return as compared to those with age 20-30 years. This finding is supported by the fact the severity and outcome of coronavirus disease 2019 (COVID-19) largely depends on a patient’s age and also with the finding of Tenforde et al. study who found a statistical significance with a p-value: 0.01 (Tenforde et al. (2020)).

In our study, we found a statistical significance between job title and delay return to work of COVID-19 workers, and this significance was lower with technicians who had lower odds of being delayed to return to work as compared to the physicians. This result is consistent with that found by Mohanty et al. who the
HCWs are more stressed because of less staff, increasing workload, longer working hours, high clientele expectation, and peculiar problems and hazards of the workplace. There is increased morbidity in HCWs in comparison to the general population (Mohanty et al. (2019)).

Concerning work criteria during the COVID-19 pandemic 14 days before the positive result, this study reported that there is a statistical significance in delaying return to work. This finding is supported by Fragala et al. article who reported that building engineering controls and workplace policies (flexible worksites, staggered shifts, sick policies) may aid in containing the spread. Reducing the rate of spread of the disease by public health interventions is necessary until medical countermeasures are developed to alleviate the strain on the health care system.

Also, they said that measures include physical social distancing, symptom monitoring (temperature monitoring), hygienic measures (masks, disinfection procedures), disease surveillance and reporting, travel restrictions, quarantine, and case isolation attenuate the risk for further disease transmission (Fragala et al. (2021)). Also, Previous studies among frontline employees primarily included healthcare workers in hospitals. Healthcare workers face a high risk of infection, particularly if risk management is insufficient. Yet, also other groups of frontline employees in close contact with other individuals are at risk of being infected during work (Nabe-Nielsen et al. (2021)).

In our study, there was no statistical significance regarding the risk category of the work area whether high risk or low-risk areas with lower odds of being delayed to return to work in those working in the non-high-risk area or both high and low-risk areas as compared to the those working in high-risk areas. This is contrary to the results found by Nielsen et al. who observed substantial differences between the different areas of work in terms of COVID-19 risk management, fear of infection, and fear of transmission of infection. This difference may be due to investigation of COVID-19 risk management among frontline employees only working within eldercare, hospital/ rehabilitation, psychiatry, childcare, and ambulance service while in our study we investigated all staff in the health care facility involved in the provision of care for a COVID-19 infected patient, including those who have been present in the same area as the patient, as well as those who may not have provided direct care to the patient, but who have had contact with the patient’s body fluids, potentially contaminated items or environmental surfaces (Nabe-Nielsen et al. (2021)).

With the investigation of health status at the time of diagnosis and the severity of the symptoms during the illness, results of the study show a statistically significant association between them and delayed return to work with those with stable health status at the time of diagnosis have lower odds of being delayed as compared to those who were sick while those whose respiratory symptoms and/or diarrhea resolved within 10-14 days or more than 14 days from the result of positive swab had higher odds of being delayed as compared to those who resolved within 10 days from the date of the positive swab. This result is due to a longer recovery time with the serious condition as according to WHO, the recovery time is estimated to be 2 weeks for patients with mild infection and 3 to 6 weeks for those with serious illnesses (Tolossa et al. (2021), Organization (2020)).

About any history of a specific disease or chronic illness, we reported a statistically significant association with delayed return to work with a p-value less than 0.001. This important finding is supported by the same results of Tenforde et al. who reported in their study on American participants a significance value of...
0.003 when compared between those who returned or not to usual health (Tenforde et al. (2020)).

Concerning health status when the recovery team contacted the participant on day 8 and its effect on return to work, our study results showed a statistically significant association between it and delayed return to work. This finding may be referred to the conclusion obtained by Weerahandi et al. in their prospective observational study on COVID patients who required at least 6 liters of oxygen during admission and supposed that patients with severe COVID-19 disease typically experienced sequelae affecting their respiratory status, physical health, and mental health for at least several weeks after hospital discharge. These sequelae delay their return to usual work (Weerahandi et al. (2020)).

Finally, in this study, we noticed a statistical significance in the association between receiving health education when a participant at home isolation and delayed return to work with those who received health education when at home isolation had higher odds of being delayed as compared to those who did not. This result may be due to that health education increase awareness about the disease and its transmission among people with insufficiency of protective strategies in health care centers. These factors raise the fear of health care workers returning to work which could explain their delay in returning to work.

REFERENCES

Fragala MS, Goldberg ZN, Goldberg SE. (2021) Return to Work: Managing Employee Population Health during the COVID-19 Pandemic. Popul Health Manag [Internet]. Feb 1 [cited 2021 Jul 7];24(S1):S3-15. Available from: /pmc/articles/PMC7875125/ Retrieved from https://doi.org/10.1089/pop.2020.0261

Mohanty A, Kabi A, Mohanty AP. (2019 ) Health problems in healthcare workers: A review. J Fam Med Prim Care [Internet]. [cited 2021 Jul 7];8(8):2568-72. Available from: https://pubmed.ncbi.nlm.nih.gov/31548933/

Nabe-Nielsen K, Nilsson CJ, Juul-Madsen M, Bredal C, Hansen LOP, Hansen AM (2021). COVID-19 risk management at the workplace, fear of infection and fear of transmission of infection among frontline employees. Occup Environ Med [Internet]. Apr 1 [cited 2021. Jul 7];78(4):248-54. Available from: http://oem.bmj.com/ Rrtrieved from https://doi.org/10.1136/oemed-2020-106831

Organization WH (2020). Coronavirus disease (COVID-19). Dashboard.

Tenforde MW, Kim SS, Lindsell CJ, Billig Rose E, Shapiro NI, Files DC, et al (2020). Symptom Duration and Risk Factors for Delayed Return to Usual Health Among Outpatients with COVID-19 in a Multistate Health Care Systems Network - United States, March-June 2020. MMWR Morb Mortal Wkly Rep [Internet]. Jul 31 [cited 2021 Jul 7];69(30):993-8. Available from: https://pubmed.ncbi.nlm.nih.gov/32730238/

Tolossa T, Wakuma B, Gebre DS, Atomssa EM, Getachew M, Fetensa G, et al (2021). Time to recovery from COVID-19 and its predictors among patients admitted to treatment center of Wollega University Referral Hospital (WURH), Western Ethiopia: Survival analysis of retrospective cohort study [Internet]. Vol. 16, PLoS ONE. Public Library of Science; [cited 2021 Jul 7]. Available from: /pmc/articles/PMC8191892/ Retrieved from https://doi.org/10.1371/journal.pone.0252389
Weerahandi H, Hochman KA, Simon E, Blaum C, Chodosh J, Duan E, et al (2020). Postdischarge health status and symptoms in patients with severe COVID-19. medRxiv Prepr Serv Heal Sci [Internet]. Aug 14 [cited 2021 Jul 7]; Available from: http://www.ncbi.nlm.nih.gov/pubmed/32817973 Retrieved from https://doi.org/10.1101/2020.08.11.20172742