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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 return to work among COVID-19 positive HCPs also 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 (StRS) cross section study.
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Keywords: Health Care, COVID-19, Workers

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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 SARSCOV-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 Specific objectives:
- 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.

Pregnant female staff

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 healthcare 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

How was your health status at the time of diagnosis	Stable	185	40.5
	Sick	233	51
	Don't remember	39	8.5
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
	None	15	3.3
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	0	0
How was your health status when the recovery team contacted you at day 8?	Sick	140	30.6
	Stable	122	26.7
	Little symptoms	195	42.7
Did you receive health education when you are at home isolation?	Yes	426	94.7
	No	23	5.1
	Nothing	1	0.2
When did you join to work?	After 10 from first result positive	82	17.9
	After 14from 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

			Delayed return to work more than 14 days		P-value
			No	Yes	
Gender	Male	N	113	117	0.816
		%	49.10%	50.90%	
	Female	N	114	113	
		%	50.20%	49.80%	
Age	20-30 years	N	34	56	<0.001
		%	37.80%	62.20%	
	31-40 years	N	42	31	
		%	57.50%	42.50%	
	41-50 years	N	58	57	
		%	50.40%	49.60%	
	51-60 years	N	66	78	
		%	45.80%	54.20%	
	Above 60 years	N	25	4	
		%	86.20%	13.80%	
Nationality	Saudi	N	103	113	0.447
		%	47.70%	52.30%	
	Non-Saudi	N	122	116	
		%	51.30%	48.70%	
Job title	Physician	N	31	65	<0.001
		%	32.30%	67.70%	

	Nurse	N	137	130	
		%	51.30%	48.70%	
	Technician	N	24	11	
		%	68.60%	31.40%	
	Administration	N	23	22	
		%	51.10%	48.90%	
	Supportive services	N	12	2	
		%	85.70%	14.30%	
Work criteria during the COVID-19 pandemic 14 days before your positive result	Front line health care worker	N	113	75	<0.001
		%	60.10%	39.90%	
	None front line healthcare worker	N	77	79	
		%	49.40%	50.60%	
	Both	N	37	76	
		%	32.70%	67.30%	
	High risk area	N	21	39	0.051

Risk category of your work area		**%**	**35.00%**	**65.00%**	
	Not high-risk area	N	107	99	
		%	51.90%	48.10%	
	Both areas	N	99	92	
		%	51.80%	48.20%	
How was your health status at the time of diagnosis?	Stable	N	77	108	0.018
		%	41.60%	58.40%	
	Sick	N	124	109	
		%	53.20%	46.80%	
How was the severity of your symptoms during the illness?	Mild	N	66	98	0.009
		%	40.20%	59.80%	
	Moderate	N	77	74	
		%	51.00%	49.00%	
	Severe	N	71	49	
		%	59.20%	40.80%	
	Critical	N	13	8	
		%	61.90%	38.10%	
What type of medical action you received?	Only self-isolation	N	98	83	0.275
		%	54.10%	45.90%	

	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 don 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	
			Lower	Upper
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?				

Only self-isolation	**REF**			
Self-isolation and treatment	1.3	0.628	0.44	3.83
Hospital admission	3.26	0.319	0.32	33.24
When did your respiratory symptoms and/or diarrhea resolve?				
within 10 days from the date of positive swab	REF			
within 10-14 days from the date of positive swab	94.12	<0.001	15.08	587.3
within more than 14 days from the result of positive swab	18.11	0.001	3.12	105.04
Do you have any history of specific disease or chronic illness (Yes)	37.76	<0.001	12.85	111
How was your health status when the recovery team contacted you at day 8?				
Little symptoms	REF			
Sick	0.31	0.058	0.09	1.04
Stable	0.4	0.133	0.12	1.33
Did you receive health education when you are at home isolation? (Yes)	144.11	0.001	7.75	2680.7

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

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.

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