



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2022; 8(7): 527-533
www.allresearchjournal.com
Received: 18-05-2022
Accepted: 22-06-2022

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A descriptive study to assess the risk factors and knowledge of self-care measures for prevention of COVID-19 pandemic among health care workers in the selected hospital of district Ambala, Haryana with a view to develop information booklet

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Abstract

The corona virus disease is caused by severe acute respiratory syndrome corona virus 2 (sars-cov-2). It was originated from Wuhan China. A health care worker is one who delivers care and services to the sick and ailing either directly as doctor or nurse indirectly as aids, helpers, laboratory technicians or even medical waste handlers. This study aims to find out the risk factors of COVID-19 and the knowledge of health care workers regarding self-care measures for prevention of COVID-19. By using the convenient sampling technique, data was collected from 100 health care workers of civil hospital Ambala City. A self-structured questionnaire was used to assess the knowledge of self-care measures and risk factors were assessed by using the checklist. The findings of study revealed that the maximum (49%) of health care workers were in the age group of 20-30 years. Majority (64%) of them were females. Majority (35%) of health care workers were nurses. Most of them (35%) were working in OPD/IPD. Majority (59%) of them were married. Majority (96%) of health care workers had good health condition. Majority (90%) of health care workers had no history of smoking, alcohol and other type of addiction. Majority (56%) of health care workers did not take any special training regarding prevention of COVID-19 pandemic in hospital. The present study concluded that out of 100 health care workers, (54%) had mild risk of COVID-19, (43%) had moderate risk, and (3%) had severe risk of COVID-19. In this study, (50%) had good level of knowledge, (48%) had adequate knowledge and (2%) had poor level of knowledge. The findings of the study concluded that this will help the health care workers to improve their practice and to know about risk of COVID-19 among them by enhance their knowledge.

Keywords: COVID-19, health care workers, risk factors, PPE kit, knowledge

Introduction

The Corona virus disease is caused by severe acute respiratory syndrome corona virus 2 (SARS-COV-2). It was originated from Wuhan China. First case of Corona was noticed in December 2019. On 30th January 2020 WHO declared COVID-19 as global emergency. WHO declared Corona virus as pandemic on 11th march 2020. As of 30th April 2020, the pandemic had affected more than 3.2 million individuals with over 2, 30000 fatal cases in 187 countries.

The transmission routes of COVID-19 from person to person includes direct transmission such as cough, sneeze, and droplet inhalation transmission, contact transmission such as the contact with oral, nasal and eye mucous membrane. Common symptoms of COVID-19 infection include Fever, Dry cough, Shortness of breath, Pneumonia.

The incubation periods of COVID-19 virus are estimated to be 2-14 days, with symptoms usually appearing within this period. Data from China indicate that approximately 85% of cases of among human transmission occur within family groups. In many instances, infected individual act as asymptomatic carriers as they do not show any symptom. As a result,

The most critical measures for infection protection and control {IPC} are hand hygiene and social distancing.

A healthcare worker is one who delivers care and services to the sick and ailing either directly as doctors and nurses or indirectly as aides, helpers, laboratory technicians, or even medical waste handlers. There are approximately 59 million healthcare workers worldwide. Health workers are at the forefront of COVID-19 outbreak response and as such are exposed to hazards that put them at risk of infection. As early as February 2020 scholars has established that transmission of disease was related with absence of isolation, room facilities, environmental contamination and overcrowding. However, in the context of rapidly evolving COVID-19 pandemic occupational health and safety policy makers need timely access to updated health information on the risk that health workers face. According to previous report WHO, 20% of those affected during the 2002 SARS outbreak were health care workers. The impact of these on health care system is concerning, given that health facilities are already overburdened by high numbers of patients, with infection among health care workers further aggravating the existing shortage of staff working to curb the spread of disease.

A Cross sectional study involved cases of laboratory – confirmed COVID-19 infection among health care workers working under the directorate general of health service of Muscat governorate, ministry of health, between February and June 2020. Data regarding the participants socio demographic characteristics, risk factors, pre-existing medical conditions and adherence to IPC measures were collected using a self-administered questionnaire distributed via a web – based mobile application. A total of 126 health care workers with confirmed COVID-19 infection participated in the study. The majority (96.8%) followed recommended hand hygiene practice, social distancing protocols (93.7%) and wore protective face masks for routine patient care. While the majority of health care workers followed crucial IPC Measures, one third had never received specific IPC training or faced restrictions on PPE use [2].

In some contexts of COVID-19, health workers face an unprecedented occupational risk of morbidity and mortality. There is need of rapid development of sustainable measures that protect health workers from the pandemic.

The studies of hospital admissions and mortality have subsequently enabled identification of more specific risk factors, they are; Age, Sex, pre-existing health conditions, the most important of which are: diabetes, hypertensive disease, cardiovascular disease and obesity, occupation, place of contact, contact with confirmed case, use of PPE kit, distance between patient and health care worker [6].

PPE kit is a physical barrier worn by health care worker to prevent spreading of pathogen from either a suspected or confirmed cases or a pathological specimen. It serves the dual role of preventing disease spread from patients to health care workers and vice – versa. These physical barriers include goggles, face shields, fluid resistant, medical and surgical mask, particulate respirators {example- powered air purifying N 95 respirator}, gloves, disposable gowns, disposable cover, water proof or heavy-duty aprons, water proof boots and hoods or head covers in conjugation with other IPC methods. Hand washing is one of the best and most effective method for prevention of infection in the hospital. Wu *et al* and the national hospital infection

management and quality control centre recently reported a large-scale infection of health care workers from the Hubei province in China that was mainly due to underutilization of PPE kit. Similarly, the Henry ford health system recently confirmed that 46.6% of its workers had been infected with SARS – COV-2. This situation necessitates critical observation of occupational hazards and workplace safety during COVID-19 pandemic. Health care workers in low resource setting need adequate PPE skills [including appropriately selection, donning, removal, decontamination and disposal of PPE kit] at the backdrop of good theoretical knowledge of indication and procedures for affective protection in clinical areas. They should also have the right attitude towards training on, approaches to, and beliefs on and the requisite skills for PPE in practice in addition to other intervention to successfully fight and win the battle against SARS – COV-2.

On May 15th 2020, the Ministry of health and family welfare of India released advisory for managing health care worker working on COVID-19 and Non-COVID-19 areas of hospital, as any health care worker having close contact/ direct care of patient without the use of mask, goggles / PPE. Close contact is defined as contact for > 15minutes, at a distance < 1meter. Such high-risk contacts are to be quarantined for 14days, they are tested for COVID-19 infection by means of a nasal / nasopharyngeal and Oro pharyngeal swab for RT-PCR. Low risk contact is not quarantined but should self-monitor for development of symptoms while continuing their work, and is tested if they develop symptoms based on which institutional policies were created. It includes guidelines like the mandatory use of N95 masks in all hospital areas, appropriate use of PPE [Personal Protective Equipment] as per designated work areas, cleaning of hospital beds, floors and the surfaces, and social distancing at the work place. This document also provides guidelines for risk stratification and management of COVID-19 exposed health care workers. High risk exposure is defined.

Need of study

The COVID-19 disease is presently a matter of global public health concern as it could be potentially fatal. Health care workers are forefront in response to COVID-19. Doctors and health care workers who are responding to global health crisis are trying to protect individual's family and communities, in adverse situation with stretched resources, shortage of PPE and other equipments.

A cross sectional study was performed to assess prevalence of COVID-19 infection among healthcare workers in southwest Iran. Data demonstrated a rate of 5.62% (273 out of 4854 cases) infection among HCW, with a mean age of 35 years and a dominance of female cases (146 cases: 53.5%). The majority of infected cases were among nurses (51.3%), while the most case infection rate (CIR) was among physicians (27 positive cases out of 842 performed tests (3.2%)) [5].

It is crucial to take care of health care workers of country as India is already struggling with the shortage of medical staff. For instance, for every 1,343 citizens in the country there is only one doctor available, whereas the WHO prescribed at least one doctor for every 1,000 citizens. Adding to the misery India lost at least 734 doctors while they were fighting with Novel Corona virus. Health care workers are being infected with the novel infection ranging

from 15% to 18% and in some cases up to 20% of the infected population [4].

Their erroneous practices may directly increase the risk of spread. Even after the proper knowledge they are not using the proper safety measure which is putting them at risk of getting infection. This study will help the health care workers to know about the risk factors of COVID-19 and self-care measures for prevention of COVID-19. This will reduce the risk of COVID-19 among health care workers and enhance their knowledge. So, they can work effectively against the COVID-19 pandemic [8].

Every country needs to tailor prevention and control programs to their specific nation context. For these reasons, understanding the risk factors of COVID-19 infection and evaluating adherence to IPC measures among health care workers is important not only for characterizing virus transmission patterns but also for preventing the infection of future health care workers and those with whom they come into the contact. As such, this study aimed to identify risk factors and knowledge of self-care measures for prevention of COVID-19 among health care workers.

Statement of problem

A descriptive study to assess the risk factors and knowledge of self-care measures for prevention of covid-19 pandemic among health care workers in the selected hospital of district Ambala, Haryana with a view to develop information booklet.

Aim of the study

This study aims to find out the risk factors of COVID-19 and knowledge of health care workers regarding self-care measures for prevention of COVID-19 to improve their practice.

Objectives

- To assess the risk factors of COVID-19 pandemic among health care workers in one of the selected hospitals at District Ambala, Haryana.
- To determine the level of knowledge regarding self-care measures for prevention of COVID-19 pandemic among health care workers in one of the selected hospitals at district Ambala, Haryana.
- To find out association between level of knowledge and selected socio demographic variables.

- To prepare and distribute information booklets on self-care measures for prevention.

Development of the instrument/tool

As per the objective of the study, research tools were developed on the basis of extensive literature review and in consultation with the experts in the field of clinical nursing, nursing education, and medical surgical nursing.

Description of tool

Tools were divided into three sections.

Section I: Socio demographic profile of the study subjects consists of 10 variables which includes age, gender, designation, area of posting, educational qualifications, marital status, health condition, habits, residence, any special training.

Section II: Risk factor assessment tool to assess risk of COVID-19.

Section III: Self-structured questionnaire to assess knowledge regarding self-care measures for prevention of COVID-19 consist of 24 items.

Organization and presentation of finding

The organized data was organized and presented under following sentence

Section I: Frequency and percentage distribution of socio-demographic variables.

Section II: Assessment of level of knowledge of health care workers regarding self-care measures for prevention of COVID-19.

Section III: Assessment of risk factor of health care workers for COVID-19.

Section IV: Association of level of risk factor and level of knowledge of health care workers with socio-demographic variables.

Section V: Interpretation of hypothesis.

Section 1: Frequency and percentage distribution of socio-demographic variables of health care workers.

Table 1: Frequency and percentage distribution of socio-demographic variables of health care workers. N = 100

Section-1 Socio demographic preformat		Frequency(f)	Percentage(p)
Age	20-30 Years	49	49%
	31-40 Years	33	33%
	41-50 Years	15	15%
	51-60 Years	3	3%
	>= 60 Years	0	0%
Gender	Male	36	36%
	Female	64	64%
Designation	Doctor	19	19%
	Nurse	35	35%
	Paramedical	18	18%
	Hospital Attendant	28	28%
Area of Posting	Emergency/Trauma Centre	15	15%
	Wards	29	29%
	COVID Isolation Ward	21	21%
	O.P.D/I.P. D	35	35%
Educational Qualifications	M.B.B.S/M. D/M. S	19	19%

	GNM/ANM/BSc	41	41%
	Pathology	4	4%
	Pharmacology	7	7%
	10th, 12 th	29	29%
Marital Status	Married	59	59%
	Unmarried	41	41%
Health Condition	Heart Disease	2	2%
	Lung Disease	2	2%
	Kidney Disease	0	0%
	None	96	96%
Habits	Alcohol Intake	8	8%
	Smoking	2	2%
	Other Type of Addiction	0	0%
	None	90	90%
Residence	Rural	37	37%
	Urban	63	63%
Any Special Training Regarding Prevention of COVID-19 in Hospital	Yes	44	44%
	No	56	56%

Majority (49%) of the health care workers were in the age group of 20 to 30 years, (33%) were in the age group of 31 to 40 years and (15%) were in the age group of 41 to 50 years.

Majority of (64%) of health care workers were female and (36%) were male. As per designation majority (35%) were nurses, (28%) of were hospital attendant, (19%) were doctor and (18%) were paramedical.

Most of them (35%) of the health care workers were posted in (OPD/IPD, (29%) were posted in wards, (21%) were posted in the COVID isolation and (15%) were posted in emergency/trauma centre.

As per their educational qualification status majority (41%) of health care workers were educated up to GNM/ANM/BSc, (29%) were educated up to 10th, 12th (19%) were educated up to M.B.B.S/M.D./M.S., (7%) were educated up to pharmacology and (4%) were educated up to pathology.

Most of them (59%) Of health care workers were married, (41%) were unmarried.

Majority (96%) had no health disease and (2%) had heart disease and lung disease.

Most of them (8%) were alcohol intake habits and (2%) had smoking habits.

Most of them (63%) residing in urban area and (37%) residing in rural area.

Most of them (56%) were not taking any special training regarding prevention of COVID-19 and (44%) were taking special training prevention of COVID-19.

Section II: Assessment of knowledge regarding self-care measures for prevention of COVID-19

Table 2: Frequency and percentage of level of knowledge of health care workers regarding self-care measures for prevention of COVID-19

Criteria measure of knowledge score		
Level of knowledge	Percentage	Frequency
Good (17-24)	50%	50
Average (9-16)	48%	48
Poor (0-8)	2%	2

The above table depicts the level of knowledge of health care workers regarding self-care measures for prevention of COVID-19. Maximum health care worker (50%) had good knowledge, (48%) had average knowledge and (2%) had poor knowledge

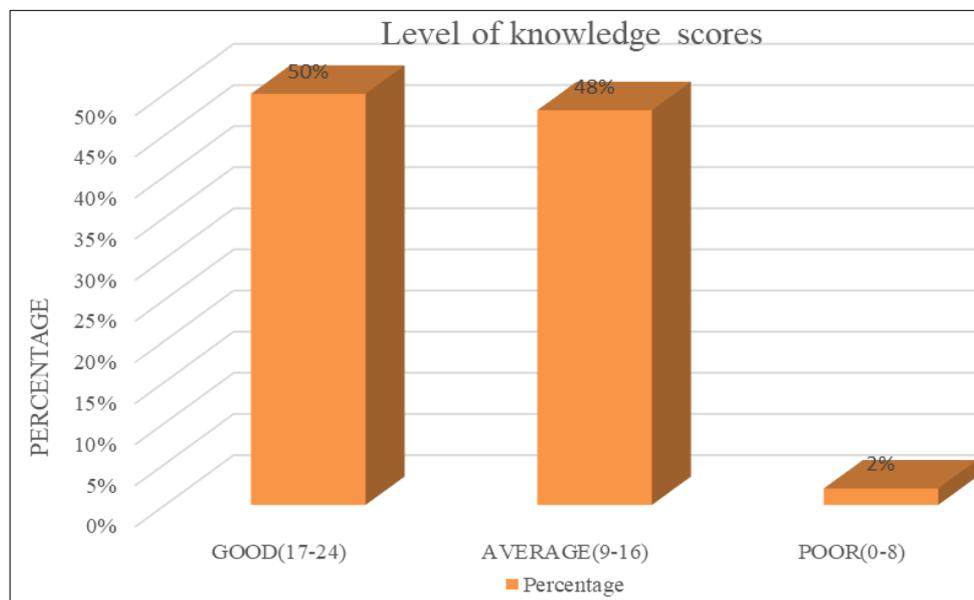


Fig 1: Bar graph showing Percentage distribution of health care workers regarding self-care measures for prevention of COVID-19

Table 3: Mean, mean percentage, median, range, and standard deviation score knowledge of self-care measures regarding prevention of COVID-19.

Descriptive Statistics	Mean	SD	Median	Maximum	Minimum	Range	Mean %
Knowledge Score	16.29	3.48	16.50	24	6	18	67.9

The above table depicts that the mean, mean score percentage, median, Range and SD OF knowledge of health care measure regarding self-care measure for prevention of COVID-19. The mean for the knowledge as 16.29, SD3.48, median 16.50, range 18, mean percentage score 67.9%.

Section III: Assessment of risk factor of health care workers for COVID-19

Table 4: Frequency and percentage level of risk factor of health care worker for COVID-19

Criteria measure of risk factors score		
Category Score	Percentage	Frequency
Mild (11-15)	3%	3
Moderate (6-10)	43%	43
Severe (0-5)	54%	54

Level of risk



Fig 2: Bar graph showing diagram showing level of scores

Table 5: Descriptive statistics table

Descriptive Statistics	Mean	SD	Median	Maximum	Minimum	Range	Mean %
Risk factors score	5.38	2.62	5.00	12	0	12	35.9

Section VI: Association of level of risk factor and level of knowledge of health care workers with their socio demographic variables. This section deals with the findings related to the association of level of knowledge of health

care workers with socio-demographic variables. The chi-square test was used to determine association between the level of knowledge of health care workers and socio-demographic variables.

Table 6: Association of level of knowledge of health care workers with socio-demographic variables N=100

Demographic Variables		Levels (N=100)			Association with knowledge Score				
Variable	Option	Good	Average	Poor	Chi Test	P Value	DF	Table Value	Result
Age	20-30 Years	18	29	2	9.775	0.134	6	12.592	Not Significant
	31-40 Years	20	13	0					
	41-50 Years	9	6	0					
	51-60 Years	3	0	0					
	> = 60 Years	0	0	0					
Gender	Male	15	19	2	4.604	0.100	2	5.991	Not Significant
	Female	35	29	0					
Designation	Doctor	18	1	0	35.871	0.000	6	12.592	Significant
	Nurse	22	13	0					
	Paramedical	4	14	0					

	Hospital Attendant	6	20	2					
Area of posting	Emergency/Trauma Centre	5	10	0	8.171	0.226	6	12.592	Not Significant
	Wards	14	13	2					
	COVID Isolation Ward	10	11	0					
	O.P.D/I.P. D	21	14	0					
Educational Qualifications	M.B.B.S/M. D/M. S	17	2	0	29.039	0.000	8	15.507	Significant
	GNM/ANM/BSc	23	18	0					
	Pathology	2	2	0					
	Pharmacology	0	7	0					
	10th, 12 th	8	19	2					
Marital Status	Married	33	26	0	4.354	0.113	2	5.991	Not Significant
	Unmarried	17	22	2					
Health Condition	Heart Disease	2	0	0	4.167	0.384	4	9.488	Not Significant
	Lung Disease	2	0	0					
	Kidney Disease	0	0	0					
	Other	46	48	2					
	None	0	0	0					
Habits	Alcohol Intake	6	2	0	4.268	0.371	4	9.488	Not Significant
	Smoking	0	2	0					
	Other Type of Addiction	0	0	0					
	None	44	44	2					
Residence	Rural	14	21	2	6.081	0.048	2	5.991	Significant
	Urban	36	27	0					
Any Special Training Regarding Prevention of COVID-19 in Hospital	Yes	28	16	0	6.710	0.035	2	5.991	Significant
	No	22	32	2					

Note* significant at 0.05

The above table shows that the association between the level of score and socio demographic variable. Based on the objectives used to Chi-square test used to associate the level of knowledge and selected demographic variables. The Chi-square value shows that there is significance association between the score level and designation, education, any special training. There is no significance association between the level of scores and age, gender, area of posting, marital status, health condition habits. The calculated chi-

square values were less than the table value at the 0.05 level of significance.

This section deals with the findings related to the association between the levels of risk factor of health care worker with socio demographic variables. The chi-square test was used to determine the association between the level of risk factor of health care worker and socio-demographic variables.

Table 7: Association of level of risk factor of health care workers with socio-demographic variables

Demographic Variables		Levels (N = 100)			Association with risk factors Score				
Variable	Opts	Good	Average	Poor	Chi Test	P Value	DF	Table Value	Result
Age	20-30 Years	1	17	31	8.632	0.195	6	12.592	Not Significant
	31-40 Years	1	18	14					
	41-50 Years	1	5	9					
	51-60 Years	0	3	0					
	>= 60 Years	0	0	0					
Gender	Male	1	14	21	0.426	0.808	2	5.991	Not Significant
	Female	2	29	33					
Designation	Doctor	2	8	9	19.419	0.004	6	12.592	Significant
	Nurse	1	18	16					
	Paramedical	0	1	17					
	Hospital Attendant	0	16	12					
Area of Posting	Emergency/Trauma Centre	0	7	8	16.271	0.012	6	12.592	Significant
	Wards	1	19	9					
	Coved Isolation Ward	0	3	18					
	O.P.D/I.P. D	2	14	19					
Educational Qualifications	M.B.B.S/M. D/M. S	2	7	10	15.824	0.045	8	15.507	Significant
	GNM/ANM/BSc	1	21	19					
	Pathology	0	0	4					
	Pharmacology	0	0	7					
	10th, 12 th	0	15	14					
Marital Status	Married	2	27	30	0.593	0.743	2	5.991	Not Significant
	Unmarried	1	16	24					
Health condition	Heart disease	0	0	2	1.824	0.768	4	9.488	Not Significant
	Lung Disease	0	1	1					
	Kidney Disease	0	0	0					
	None	3	42	51					
Habits	Alcohol Intake	0	2	6	3.509	0.477	4	9.488	Not

	Smoking	0	0	2					Significant
	Other Type of Addiction	0	0	0					
	None	3	41	46					
Residence	Rural	1	20	16	2.945	0.229	2	5.991	Not Significant
	Urban	2	23	38					
Any Special Training Regarding Prevention of COVID-19 in Hospital	Yes	0	19	25	2.473	0.290	2	5.991	Not Significant
	No	3	24	29					

Note* significant at 0.05

Above table shows that the association between the level of score and socio demographic variable. Based on the objectives used to Chi-square test used to associate the level of knowledge and selected demographic variables. The Chi-square value shows that there is significance association between the score level and designation, area of posting, education, and qualification. There is no significance association between the level of scores and other demographic variables age, gender, habit, marital status, health condition, residence, any special training. The calculated chi-square values were less than the table value at the 0.05 level of significance

Section V: Interpretation of hypothesis

H-1: There will be a significant knowledge of self-care measures for prevention of COVID-19 pandemic among health care workers.

H-2: There will be a significant association between risk factor and knowledge scores with various socio-demographic variables.

Research findings revealed that the majority of health care workers 50% had average knowledge, 48% of health care workers had average knowledge, and 2% health care workers had poor knowledge regarding prevention of COVID-19 hence our research hypothesis (H1) is accepted.

Research findings revealed that the mean knowledge of health care workers is socio-demographic variables: shows association with the knowledge score of health care workers regarding risk factors of COVID-19. Calculated chi square values are greater than their tabulated values. Hence our research hypothesis (H2) is rejected.

Many variables like age, gender, posting area, marital status, health condition, habits. Shows no significant association with the knowledge of health care workers regarding risk factors of COVID-19. Calculated chi square values are lesser than their tabulated values. Hence our Null hypothesis (H0) is accepted.

Conflict of interest: There is no such conflict and bias during study.

Ethical clearance: No ethical issue exists.

Conclusion

The present study concluded that out of 100 health care workers, (54%) had mild risk of COVID-19, (43%) had moderate risk, and (3%) had severe risk of COVID-19. In this study, (50%) had good level of knowledge, (48%) had adequate knowledge and (2%) had poor level of knowledge. It was concluded that from all the socio-demographic variable like age, gender, designation, area of posting, educational qualification, marital status, health condition, habit, residence, any special training regarding the prevention of COVID-19 in hospital. It was found that there was significance association of level of knowledge with

designation, area of posting, health condition, habits and any special training regarding the prevention of COVID-19 in hospital.

The study concluded that COVID-19 can be reduced by using of proper PPE kit, using of hand sanitizer and proper disinfectants used in hospitals, maintaining an adequate distance between visitors and patient.

Extensive information, preventive program will be the key to reduce the risk of COVID-19 and improving the knowledge of health care workers regarding self-care measures for prevention of COVID-19.

References

1. Tafazwa Dzinamaria. Risk factors for COVID-19 among health care workers (Cited 4 May 2021) available from: <http://journals.plos.org/plosone/article?>
2. Zahir Ghassan, Hilal al Abri. Risk factors associated with COVID-19 infected health care workers in Muscat, Governate, Oman (Cited 26 January 2021) available from: [sagepub.com/journalspermissionsDOL:10.1177/215013272099454](https://www.sagepub.com/journalspermissionsDOL:10.1177/215013272099454)[journals.safepub.com/home/jpg](https://www.safepub.com/home/jpg)
3. COVID-19 pandemic in Oman. Wikipedia 2020, (Cited 29 October 2020), Available from: http://en.wikipedia.org/w/index.php?title=COVID-19_pandemic_in_oman&oldid=98538868.
4. Kamlesh Khunti. Assessing risk for health care workers during the COVID-19 pandemic (Cited 15 March 2021) Available from: [BMJ2021.372:n602](https://doi.org/10.1136/bmj.n602) DOI: <http://dx.doi.org/10.1136/bmj.n602>
5. Sabetian G Mpphadami, Hashemi Zahed fard Haghghi 1, *et al.* COVID-19 infection among health care workers: a cross sectional study in Southwest Iran. (Cited 17 March 2021), *Viralj*. Available from: 2021;18:58. DOI: http://doi.org/10.1186/512985_021_01532-0
6. Ayush Agrawal, Piyush Ranjan, Arjun Saraswat. Are health care workers following preventive articles in the CIVID-19 pandemic properly? A cross sectional study from India. (Cited 4 December 2020), Available from: DOI: <http://doi.org/10.1016/j.dsx.2020.12.016> www.elsevier.com/locate/dsx
7. Sim MR. the COVID-19 Pandemic: major risk to healthcare and other workers on the front line. *Occup Environ Med* 2020;77(5):281.
8. WHO. Corona Viruses disease 2019 situation report. April 2020;101:30, Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019?gclid=EAIaIaQobChMIzsm4kb3v8gIVjguRCh09PgX9E AAYASAAEgIv>