



OCCUPATIONAL HEALTH HAZARDS AMONG THE HEALTHCARE WORKERS DURING COVID-19 - A REVIEW

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ABSTRACT

SARS-CoV-2 or COVID-19 pandemic spread throughout the world and infected more than 750 million people of different countries. According to WHO COVID-19 dashboard, near about 7 million deaths had been recorded during this pandemic till date. Various preventive and control measures had been taken to fight against the COVID-19. During the pandemic, healthcare workers (HCWs) played most crucial role. In spite of shortages of PPE kits, essential consumables and emergency healthcare equipments, nearly 59 million healthcare workers had served the world with their experience, knowledge and dedication, and saved millions of life throughout the globe. During that emergency situation, these healthcare workers not only infected by the corona virus but also suffered from various types of occupational health hazards. Several risk factors such as rapid transmission of infection, excessive workload, shifting duties, hazardous working environment and psycho-social issues made them the most vulnerable group during COVID-19 pandemic. Advanced healthcare system should ensure the occupation health-safety programme for every healthcare worker.

KEYWORDS : SARS-CoV-2, COVID-19, Healthcare workers, Occupational health hazards

INTRODUCTION

SARS-CoV-2 or Sever Acute Respiratory Syndrome Corona Virus 2 appeared as the corona virus infection disease 2019 which was also known as COVID-19 and rapidly spread pandemic throughout the world [1]. According to WHO report, since its first exposure in December 2019, more than 253 million people had been infected worldwide till November, 2021 [2]. According to WHO Coronavirus (COVID-19) dashboard, more than 750 million people are infected till date throughout the world. Several preventive measures had been taken to minimize the effects of this pandemic such as social distancing, lockdowns in phages, practice of hand sanitization, cross-border restrictions, and most importantly mandatory mask using [3]. One of the most crucial parts was the healthcare support to the general community during that sudden emergency situation. But most of the countries' public healthcare systems were not ready to deal with this type of sudden emergency situation. Personal protective equipments (PPEs), consumables, emergency healthcare equipments etc. were required for treatment of infected patients. Inadequate number of PPE kits had been reported by many countries due to increased demand of masks, hand sanitizer among general population to prevent the spread of COVID-19. This shortage of PPE kits contributed in additional risk of infection among the healthcare workers (HCWs) [4].

Across the world, more than 59 million healthcare workers (such as medical practitioners, dentists, surgeons, nurses, midwifery personnel, medical laboratory technicians,

pharmacists and other healthcare related personnel) are engaged in different healthcare systems as reported by WHO [5]. These HCWs are exposed to different types of occupational health hazards viz. sharp injuries, exposure to radiation and drugs, physical and mental stress as well as several forms of infections. MacIntyre, *et al.*, (2017) have reported that biological hazards (viral and bacterial infections) among the HCWs are much higher compared to general population [6]. HCWs highly infected by COVID-19 but other respiratory tract infections (latent tuberculosis, symptomatic tuberculosis etc.) were also reported in several studies [7, 8]. Infection control and prevention became fragile in most of the healthcare systems due to rapid transmission and severity of COVID-19 infection among the HCWs [9].

Due to this rapid transmission with shortage of PPE kits and excessive workload, healthcare workers were became the most vulnerable group during COVID-19 pandemic [10, 11]. In addition, working environment, shifting duties, psycho-social issues, team management, prolonged working hours also affected their health and safety provision [12, 13]. In this study, an attempt is made to highlight various occupational health hazards faced by the healthcare workers during COVID-19 pandemic.

METHODOLOGY

Initially 61 papers had been selected for this present study. But due to some data lacking and unavailability of full papers, 47 papers have been included in this review study.

Time Line Of Research

Year	Authors	Observations
2020	Piero, P. et. al. [14]	Among 82961 healthcare workers, 12.2% had found positive in SARS-CoV-2 antibody test in Italy during the early phage of COVID-19 pandemic (1st April to 26th May, 2020).
2020	Long, H.N. et. al., [15]	2.74% of 99795 front-line healthcare workers tested positive in COVID-19 test during a cohort study from 24th March to 23rd April, 2020 in the UK and USA.
2020	Mhango, M. et. al. [16]	Health workers faced occupational morbidity and mortality during Covid-19 pandemic due to some risk factors such as poor infection control, infected patient handling with lack of PPEs, etc. (till 20th April, 2020).
2020	Chou, R. et. al. [17]	Repeatedly exposed healthcare workers experienced high rate of infections but less mortality and severe illness compared to non-healthcare workers. Hospital staff suffered from acute stress related disorders as well as stigma due to rejection by their neighbor for their hospital job.
2020	Nguyen, L.H. et. al. [18]	This study reported that in USA and UK, 5545 out of 99795 front-line HCWs found positive in COVID-19 test and these front-line HCWs were in much higher risk side compared to general community individuals.

2020	Garzaro, G. et. al. [19]	In Italy, 80 (9.6%) out of 830 HCWs tested positive in COVID-19 test and higher number of infections were also found among HCWs engaged in management sections.
2020	Ran, L. et. al. [20]	72 healthcare workers diagnosed with ARI (Acute Respiratory Illness) in Wuhan, China. Factors identified behind the high risk were longer duration of work, high-risk departmental duties and poor hand hygiene practice after patient handling.
2020	Wang, X. et. al. [21]	At Union hospital in Wuhan, China, it was observed that HCWs who's engaged in night shift were suffering from sleep disorders with higher working pressure (25th December, 2019 to 15th February, 2020).
2020	Harrison, D., et. al. [22]	The study revealed that 1881 (2.5%) out of 75184 healthcare workers were infected by SARS-CoV-2 in which 14.5% were critical and the mortality rate was 1.3%.
2020	Aksoy, Y.E., and Kocak, V. [23]	In turkey, among 758 nurses and midwives, 62.4%, 54.5% and 42.6% claimed about difficulties in uncertain situation dealing, worsen life style and psychological stress respectively.
2020	Hunter, E. et. al., [24]	This observational cohort study from UK and USA between 24th March to 29th April, 2020, found that front-line HCWs had higher risk for COVID-19 compared to general community.
2020	Rivett, L. et al., [25]	This study reported that 3% out of 1032 asymptomatic healthcare workers tested positive in SARS-CoV-2 screening.
2020	Algado-Selles, N. et. al. [26]	The study showed that frequency of COVID-19 positivity was 22.8% among non-protective symptomatic HCWs whereas 13.7% among protected HCWs (2nd March, 2020 to 19th April, 2020). 26.3% male and 6.8% female COVID-19 positive healthcare workers were required to hospitalization.
2020	Christopher, A.M. et. al. [27]	In UK, a higher positivity rate of COVID-19 (23.2%) was found in black ethnic group healthcare workers engaged during 1st National lockdown in March 2020.
2020	Piapan, L. et. al. [28]	In Trieste, north-east Italy, 72% HCWs were infected in geriatric division in first cluster whereas in 2nd, 3rd and 4th cluster, respectively 26%, 39% and 87% HCWs were infected.
2020	Barrett, E.S. et. al. [29]	In a cohort study in university hospitals, USA, more than 7% higher risks was found among HCWs compared to non-HCWs. Nurses were the most vulnerable among all healthcare workers.
2020	Mbachu, C.N.P et. al. [30]	Study showed that female healthcare workers of the South-Eastern state of Nigerian had poor attitude to their job than male healthcare workers due to fear of death with lack of PPEs.
2020	Luo, M. et. al. [31]	Higher psychological stress and mental impact had been reported among healthcare workers from 17 countries (1st November, 2019 to 25th May, 2020).
2020	Iversen, K. et. al. [32]	The study found that 1163 (4.04%) out of 28792 healthcare workers identified seropositive of COVID-19 in Denmark. It was also reported that seroprevalance was higher in case of male HCWs than female HCWs (15th to 23rd April, 2020).
2020	El-Boghdadly, K. et al. [33]	During 5148 tracheal intubation processes, around one out of ten HCWs was infected by COVID-19 as reported from a survey among 1718 HCWs from 503 hospitals located in 17 countries.
2020	Keeley, A.J. et al. [34]	In UK, 282 (18%) out of 1533 symptomatic HCWs were tested positive in SARS-CoV-2 (16th to 29th March, 2020).
2020	Chatterjee, P et. al. [35]	This multivariate analysis showed that healthcare workers engaged in endotracheal intubation in hospital, had higher risks of SARS-CoV-2 infection.
2021	Thirunavukkarasu, A. et al. [36]	In Northern Saudi Arabia, healthcare workers exposed in work related stress (69.6%) followed by needle stick injuries (34.5%) during the pandemic (April to September, 2021).
2021	Gómez-Ochoa, S.Á. et. al. [37]	The study showed that most frequently affected health care personal were nurses (48%) and most COVID-19 infected were medical personal (43%) engaged in non-emergency wards.
2021	Parotto, M. et. al. [38]	The study showed that high risk was found among the healthcare workers during tracheal intubation of known or suspected COVID-19 patients in Canada.
2021	Hussen, H., and Alemu, Z.A. [39]	This cross-sectional study in Ethiopia reported that 243 (76%) out of 318 HCWs had high COVID-19 exposure risk (September to October, 2020).
2021	Jacob, J.T. et. al. [40]	Among 24749 healthcare professionals, 4.4% seropositivity was found in this cross-sectional study from three states of USA.
2021	Julia, M.B. et. al. [41]	In the USA, SARS-CoV-2 seropositivity was found 3.8% among 10275 healthcare workers of a large healthcare system during April to June, 2020.
2021	Rodriguez-Lopez, M. et. al. [42]	This case-control study in Colombia found that higher risk factors for COVID-19 infection among healthcare workers were lack of using high quality masks and personal protective equipments.
2021	Dev, N. et. al. [43]	In India, 16.32% healthcare workers found positive in COVID-19 test and among them near about 45% were asymptomatic.

2021	Contejean, A. et al. [44]	In an university hospital, Paris, 373 out of 1344 positive cases was reported among the healthcare workers in which 70% were engaged in patient-facing hospital activities.
2021	Mutambudzi, M. et al. [45]	Health care workers had a much higher risk of sever COVID-19 (RR 7.43, 95% CI 5.52 to 10.00) than non-essential workers (16 March to 26 July 2020).
2021	Eman, C. [46]	Healthcare workers got the infection mainly from their workplace and community and they acted as source for their family and contact persons.
2021	Poletti, P et al. [47]	In Italy, 10115 (12.2%) out of 82961 healthcare workers found positive in SARS-CoV-2 antibody test where significantly higher risk was found among healthcare assistants.

CONCLUSIONS

Healthcare workers are exposed in various types of occupational health hazards such as physical, chemical, biological, mechanical as well as psychological hazards in their daily working scheduled. During COVID-19 pandemic, the most vulnerable was the healthcare workers. Due to rapid transmission of the infection and shortages of PPE kits, many of them were severely infected by this virus. In addition, prolonged duty hours, shifting duties, psycho-social issues etc. created a negative impact on their health. Modern healthcare system should ensure the healthy and safe working conditions for every healthcare worker and the occupational health-safety programme in context with infection prevention and control should be included in it. Mental and psycho-social support, adequate sanitation, proper work-rest cycle and hygiene should be made available to all healthcare workers.

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