

Risk Assessment and Management of Exposure of Health Care Workers In The Context of COVID-19 According to WHO in Egypt

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Abstract

Background: Infection prevention and control strategies of WHO to prevent transmission of COVID-19 in health-care settings comprise the following: early finding, source, organizational, and environmental controls, and Personal Protective Equipment (PPE). WHO reported on 22 April 2020 that established three congresses: Personal Protection Equipment (PPE), Diagnostics and Clinical care to report global market shortage for critical supplies required for the global COVID-19. The aim of the current study to evaluate risk assessment and management of exposure of health care workers in the context of COVID-19.

Research Design: A prospective, descriptive research design was utilized in this study. A random sample of 230 responds of HCWs, via an internet survey. **Tool:** one tool was used; risk assessment and management of exposure of health care workers in the context of COVID-19. **Results:** The study reported the high-risk of COVID-19 to three clusters: 1st group who didn't wear PPE with infected cases (20%), 2nd group of HCWs who used a PPE but not with all cases or contact with the environment of patients, (20 to 35 %) and 3rd group (34%), of high risk who exposed to accident biological material during interaction with a COVID-19 patient. WHO surveillance raises the staff's attention to PPE management and recommendation.

Recommendations: Health care sitting should Provide her staff with enough PPE, and demonstrate the purpose and use of each PPE. Update the policy of PPE according to WHO recommendations.

Keywords: Risk Assessment, Health Care Workers, COVID-19, PPE

Introduction

On Feb 14, Egypt announced its first COVID-19 case. Then, Egypt claimed preventive measures. Limited lockdown starting on March 25, Nasopharyngeal swabs from symptomatic patients and contacts of confirmed cases drew in the earlier 2 weeks. Body temperature and clinical assessment were done as screening at the airport⁽¹⁾.

Hospitals play an essential role within the health system in providing essential medical care to the patients and the community⁽³⁾. Extensive outbreaks can lead to

the progressive spread of infection and disease with rapidly increasing service demands that potentially submerge the capacity of hospitals and the health system at large⁽²⁾.

During the current outbreak of COVID-19, support services and supplies would potentially critical the providing of acute health care by an unready health-care facility⁽⁵⁾. Besides, a high rate of staff absenteeism and turnover can be expected. A shortage of pivotal equipment and supplies could limit access to needed care and have a direct impact on healthcare service⁽⁶⁾. Even for a well-prepared hospital readiness, make more precautions, protect the health care team that closed contact with patients, and coping with the health outcome of a COVID-19 outbreak would be a complex challenge⁽⁴⁾. The proactive and systematic application of specific actions can facilitate effective hospital-based direction during a rapidly evolving outbreak⁽³⁾.

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Present investigations suggest that the virus that causes COVID-19 is transmitted between individuals through close contact and droplets⁽⁸⁾. Individuals most at risk of acquiring the disease are those who are in contact with or care for patients with COVID-19. This inevitably organizations of health care workers (HCWs) at high risk of infection⁽⁹⁾. Protecting HCWs is of top importance to WHO⁽⁴⁾.

The use of personal protective equipment and clothing should be carefully considered since resources are currently in short supply⁽¹⁾. Surgical masks, in particular, are utilized widely within the general population but have not been clinically proven to reduce or prevent the acquisition of COVID-19⁽³⁾. Within the hospital setting, however, high-filtration masks including N95, goggles, and gowns should be worn by healthcare professionals working in direct contact (within 1-2 meters) of infected patients⁽⁷⁾.

Justification of the study

Occupational risks are demonstrating during the initiatory stages of the COVID-19 outbreak. Healthcare workers (HCWs) more risks for infection with COVID-19⁽⁹⁾. HCWs who regularly came into contact with patients with suspected COVID-19. The researchers introducing this study attempts to evaluate risk assessment and management of exposure of health care workers in the context of COVID-19

Aim of the Study

The aim of the current study to evaluate risk assessment and management of exposure of health care workers in the context of COVID-19

Research Questions

- What are the risk groups of health care workers who exposed to in the context of COVID-19?

SUBJECTS and METHOD

Research Design:

A prospective, descriptive research design was utilized to achieve the aim of the current study.

Setting:

The study surveillance was conducted to cover Giza

city hospitals, that has emergency room which services a critical case, it is for non-quarantine services.

Subjects:

It was a random sample included all health care workers (staff nurses, Radiology Technicians, Laboratory technicians, Respiratory therapists Nursing assistants, and physicians). The E-mail was sent to a list of graduated staff from faculty of applied medical science. 230 responses were collected out of 600 surveillance forms sent.

Data Collection Tools:

Tool 1: risk assessment and management of exposure of health care workers in the context of COVID-19:

It is classified into two parts:

Part one: personal datasheet

It was used to collect data about the personal data characteristics of the study participants. It included items related to such as age, gender, qualification, years of experience.

Part two: risk assessment and management of exposure of health care workers in the context of COVID-19 was developed by WHO⁽¹⁰⁾.

It used to collect the data concerning risk assessment and management of exposure of health care workers in the context of COVID-19. The questionnaire includes four dimensions measured by (18 questions) as **HCW activities performed on COVID-19 patient in health care facility** dimension with a total of (5 questions); **adherence to IPC procedures during health care interactions** dimension with a total of (7 questions); **adherence to IPC measures when performing aerosol-generating procedures** (6 questions); and **accidents with the biological material** dimension with a total of (1 questions). Responses for all dimensions were measured yes or no or Always, as recommended, Most of the time, Occasionally and Rarely.

Tools validity and Reliability

Validity:

Study tool content validity was done, to examine the instrument for content, coverage clarity, wording,

length, format, and overall appearance.

Reliability:

The reliability test was estimated using Cronbach’s Alpha Coefficient for the tool was used to measure the internal consistency of the items composing each dimension of the tool.

Pilot study:

The pilot study was carried out on (10%) of the current sample to ensure the clarity and applicability of the items, and to estimate the time needed to complete the questionnaire. Filling the questionnaires was ranged between 7-15 min. Based on the pilot study analysis no modifications were done in the questionnaires. So, a number of the pilot study was included in the total number of the study sample.

Ethical Consideration:

The aim of the study had been explained to the HCW

included in the study, through the E-mail. They were volunteers, allowed to refuse or to participate, and they were assured that their information will be confidentially utilized and used for the research purpose only.

Procedure

- The list of participants e-mail was prepared at Microsoft sheet.
- the researcher using the Cover page attached to E-mail. (Aim of study and approval consent)
- Data were collected in nearly one month from 28 March 2020 to 26 April 2020.

Statistical design

Data were tabulated and analyzed by the google sheet.

Results

Part I: personnel characteristic of study sample (230) health care workers

Table (1) Distribution of the personal data regarding to study participants (n=230)

Personal data	Study participants (n=230)	
	No	%
Age		
· 20-30 yrs.	204	88.7
· >31	26	11.3
Mean+ SD	28.04+ 10.49	
Gender		
· Male	107	46.5
· Female	121	53.5
Educational Qualification		
· Diploma Degree	0	0.0
· Technical Institute	0	0.0
· Bachelor Degree	230	100
Years of Experience		
· 1-10 yrs.	218	94.8
· 11-21 yrs.	12	5.2

Table (1) shows that the majority of study participant (88.7%) have age ranged from (20-30) years old. Regarding their gender, more than half (53.5%) of them are females. Concerning the educational qualifications all study participants (100%) have Bachelor degree. Also, the majority of sample (94.8%) have 1-10years of experiences.

Figure (1): Shows that health care workers participated in risk assessment survey which 27.9% are Nursing Staff, 29.7% Radiology Technician, 23.6% laboratory Technician, 17.5% Respiratory therapist, and 3.3% physicians.

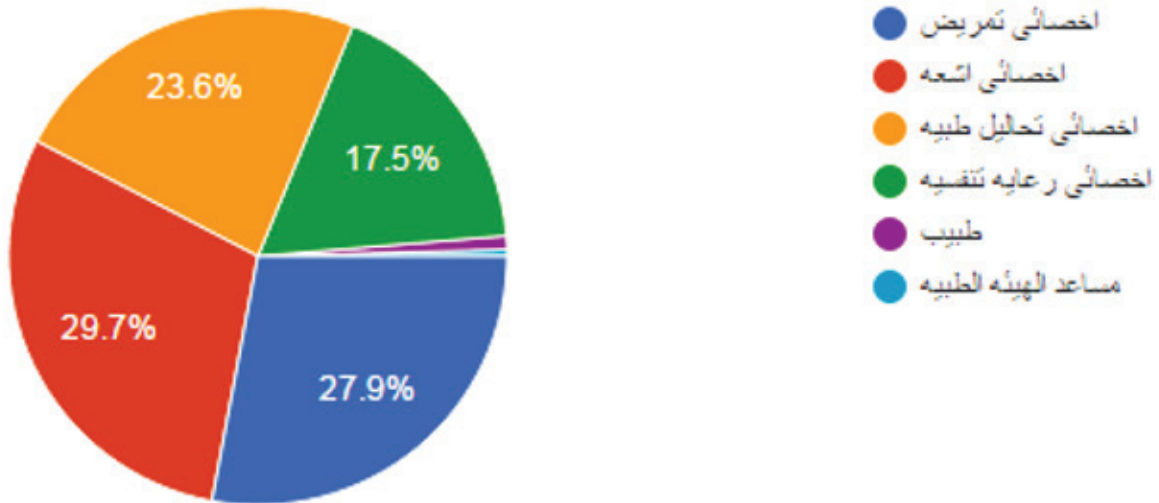


Figure (1): Distribution of study participants regarding their jobs (n=230)

Part II:

Health care worker activities performed on COVID-19 patient in a health care facility:

1. **Figure (2):** Illustrates that 13% of study participants are provide direct care for a confirmed COVID-19 patient.

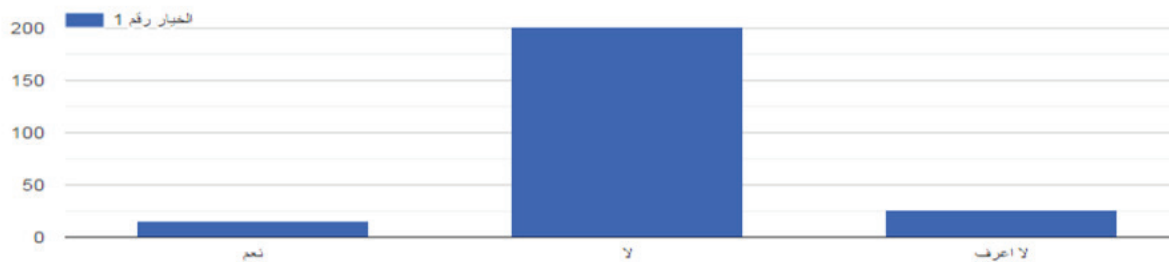


Figure (2): Distribution of study participants regarding direct care with COVID-19 patient (n=230)

2. **Figure (3):** Illustrates that 17 % of study participants are risk because they had face-to-face contact (within 1 meter) with a confirmed COVID-19 patient in a health care facility.

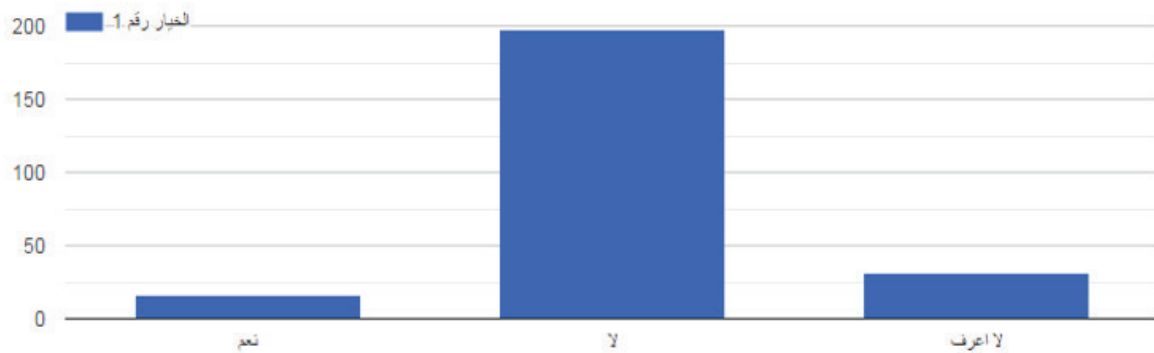


Figure (3): Distribution of study participants regarding face-to-face contact with COVID-19 patient(n=230)

3. **Figure (4):** Shows that 20% of study participants are high risk because exposed to COVID-19 patient's without PPE.

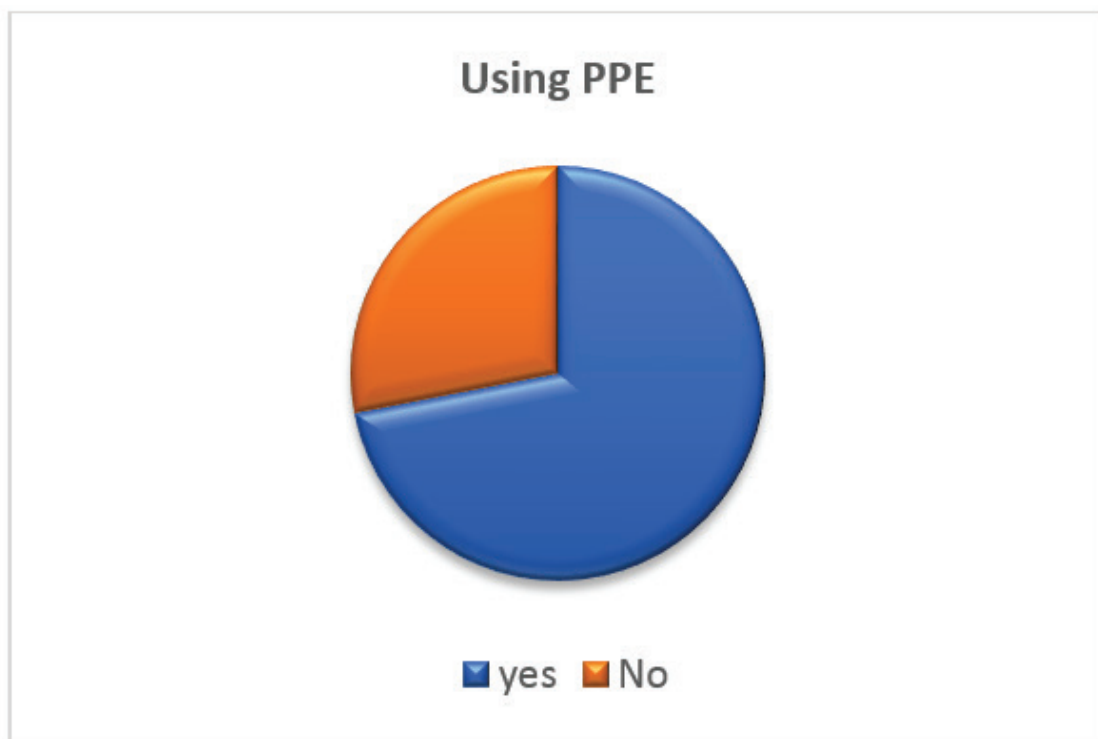


Figure (4): Distribution of study participants regarding high risk(n=230)

Part III:

Accidents with biological material (During a health care interaction with a COVID-19 patient, have any type of accident with body fluid/respiratory secretions)

4. **Figure (5):** Displays that about one third of the sample (34%) have accident with biological material.

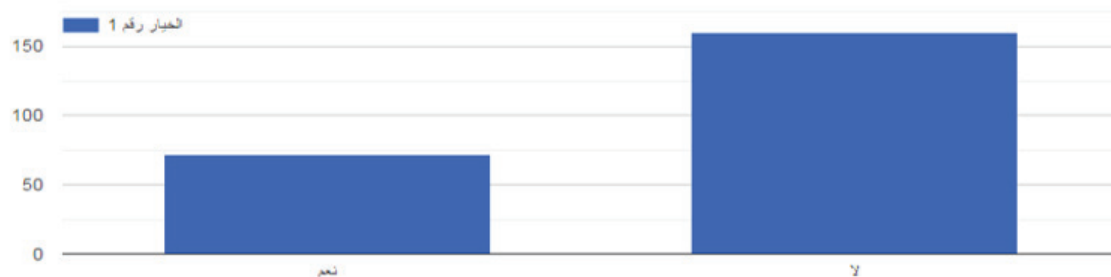


Figure (5): Distribution of study participants regarding an accident with biological material(n=230).

Discussion

In China, December 19 start the spread of Pneumonia disease among people with unknown etiology in Wuhan City. Soon discover the causative agent as a novel coronavirus and named by the World Health Organization (WHO) by COVID- 19⁽¹¹⁾.

The outbreak of COVID 19 showed that hospital setting hasn't enough Personnel protective equipment (PPE), shortage of staff, poor sleeping due to increasing of working hours and working pressure associated with a high risk of COVID-19 at the hospital sitting among health care workers especially no clear evidence of transmission mode of Virus infection⁽¹²⁾.

In the current study, show high-risk exposure of Health Care workers (HCWs) to COVID -19 during providing direct care to infected patients. PEE using frequency according to WHO recommendations weren't clear. The surveillance is done at the acute hospital for Non-quarantine hospitals as observed that most of the infected hospital staff were detected from some hospitals for example (Souad Kafafi Hospital detected three from her HCWs, and Cancer institute's hospital had twenty-three HCWs were infected at Cairo city). It was experiential also that HCWs could infect each other during daily activities.

Through 230 respondents out of 600 questionnaire surveys sent via the internet remained very low, particularly the physician rate might be due to shortage of staff and workload pressure during outbreak disease. The response distribution among HCWs very close at

the rate and all of them have the same risk to expose COVID-19 patients.

The current study reveals that 13% of Health care worker was providing direct care to a confirmed COVID-19 patient and 20% not sure during the period of the research study (one month).

The study report that there were three groups of HCWs high risk due to different ways: 1st group who didn't wear PPE during providing direct care to infected cases, that is 20%, It might be due to shortage of PPE at the hospital sitting, unclear policy, or work overload but could be also that HCWs didn't aware enough by the transmission mode for began of outbreak disease and delay of WHO recommendation.

2nd Group of HCWs who used a PPE most of the time (it means 50% or more but not 100%) for single use of Gloves, medical mask, and Gown. These groups range from 20 to 35%, these reveal to some hospital sitting don't have enough supplies of PPE. During a health care interaction with the COVID-19 patient, the same percentage also for HCWs who didn't remove and replace PPE according to the protocol (e.g. when medical mask became wet, disposed of the wet PPE in the waste bin, performed hand hygiene, etc.

Also, Health care workers who had direct contact with the environment where the confirmed COVID-19 patient was cared for (bed, linen, medical equipment, bathroom, etc.) Most of the time wear PPE but not almost.

On another hand, HWCs who performing aerosol-generating procedures (e.g. tracheal intubation, nebulizer treatment, open airway suctioning, collection of sputum, tracheotomy, bronchoscopy, cardiopulmonary resuscitation (CPR), etc.). Most of them perform open airway suction and 50% only wear N95 masks during the procedure.

The last group, of high risk who an accident had biological material during a health care interaction with a COVID-19 patient, with body fluid/respiratory secretions. The present study report that 34% of HCWs were exposed to respiratory secretion during providing direct care to infected cases. The person to the Person spreading of the virus occurs due to direct contact with an infected case, exposed to coughing, sneezing, respiratory droplets, or aerosols. These aerosols can penetrate the human body (lungs) via inhalation through the nose or mouth⁽¹³⁾.

It was expected particularly most of the cases enter to the Emergency room (ER) with regular signs and symptoms of pneumonia and not confirmed COVID-19. Such cases go into a regular investigation and examination procedures at the ER. Non-confirmed cases could be more dangerous than confirmed as the length of stay at ER or General ward without Isolation protocol may lead to an outbreak at hospital staff. Also, the Ministry of Health distributes its guidelines \ protocol for dealing with suspected cases in March 2020 after an outbreak among HCWs. The clinical manifestations of COVID-19 are variable, which include an asymptomatic carrier, Acute respiratory diseases (ARD), and pneumonia of varying degrees of severity. Primary, the cases were diagnosed based on positive viral nucleic acid test results, but without any COVID-19 symptoms, such as fever, or respiratory symptoms, and no significant abnormalities on chest X-ray, However, the transmission of COVID-19 through asymptomatic carriers via person-to-person contact was identified in many studies⁽¹⁴⁾.

Above and beyond, WHO surveillance was including all updated management recommendations that raise the awareness to all participants through questions form so they can detect the mistake could fail into. This led them to review their policies to be matching with WHO recommendations ⁽¹⁵⁾. Patient safety and staff safety

comes first.

Recommendations:

- o Health care setting should Provide her staff with enough PPE.
- o Demonstrate the purpose and use of each PPE.
- o Update the policy of PPE according to WHO recommendation.
- o Using PPE as a routine with all cases (Confirmed and Non-confirmed COVID-19) and replaced or removed according to WHO recommendation.
- o Hand washing before and after contact with patients or patient environment.
- o Using PPE through contact with the environment where the confirmed COVID-19 patient was cared for.
- o Stop working for 14 days after the last day of exposure to a confirmed case and be tested for COVID-19 (according to WHO recommendations).
- o Quarantine for 14 days in a nominated setting to HCW after confirmed with COVID-19. (According to WHO recommendations).

Conclusion

The current study conducted via an internet survey for 230 HCWs who work at hospitals of Giza city and used WHO assessment of high-risk for March 2020. The present study reported the high-risk of COVID-19 to three clusters: 1st group who didn't wear PPE with infected cases (20%), 2nd group of HCWs who used a PPE but not with all cases or contact with the environment of patients, (20 to 35 %) and 3rd group (34%), of high risk who exposed to accident biological material during interaction with a COVID-19 patient. Besides, WHO surveillance raises the staff's attention to PPE management and recommendation.

Ethical Clearance: It doesn't require because there is no any experimental data collected as well no health care institution mentioned. The data is collected from Health care workers in different hospitals in Giza city; exists their personal opinion which does not violate the ethical standards.

Source of Funding: Self

Conflict of Interest: Nil.

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