

## **The Effect of Suitable Personal Protective Equipment (PPE) For Front-line Medical Staff Who Treat Covid-19 Patients**

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### **Abstract**

Personal protective equipment, ( PPE) is specific clothing or equipment, worn by an employee for protection against infectious agents. With the Covid-19 pandemic, it is especially crucial to know more about personal protective equipment in order to reduce exposure to harmful or pathogenic bacteria in the healthcare setting. The goal of the study is to evaluate the level of training and knowledge that healthcare workers have about the use of PPE. To gather data, the researcher employed an online questionnaire made up of unbiased questions about routine clinical practice while adhering to a conventional PPE methodology. All information was entered and examined. The study's findings indicate that 49.5% of hospital employees, including men and women, require more instruction from infection control specialists in order to improve their understanding of proper PPE donning and donning protocol, PPE usage etiquette, and preserving personal cleanliness. Additionally, there is a link between applying the advised PPE with confidence and the advantages of additional PPE training. For frontline healthcare personnel to obtain the necessary knowledge and skills in pandemic scenarios, comprehensive PPE training is crucial. The researcher recommended developing comprehensive educational healthcare units prior to any epidemic through the use of medical equipment and training programs for all medical employees, expanding research, and increasing the use of databases and analysis.

**Keywords:** *Personal Protective Equipment (PPE); Occupational Safety and Health Administration (OSHA); National Institute for Occupational Safety and Health (NIOSH); Disease Control and Prevention (CDC)*

## **Introduction**

The covid-19 pandemic has now spread to more than 200 countries. As the number of patients with severe illness increased and a large number of healthcare workers contracted the virus in the early stages of the outbreak in Wuhan, China, the healthcare system became overburdened.

The United States, Europe, and Arab nations all had comparable issues. The ability to treat patients, the morale of the staff, and public confidence are all significantly harmed by the infection of medical personnel during an epidemic. Therefore, in any healthcare system's response to covid-19, the proper protection of healthcare staff must come first.

When the outbreak first started, it wasn't obvious what personal protective equipment would offer healthcare workers enough safety when caring for covid-19 patients. A research trial has demonstrated that N95 respirators are more effective than medical masks at protecting healthcare workers from respiratory virus infection. According to a meta-analysis, wearing a facemask had a non-significant protective impact but maintaining good hand cleanliness significantly reduced the risk of contracting influenza during the 2009 pandemic.

## **Problem of Study**

Healthcare workers are still susceptible to covid-19 until a safe and effective vaccination is made available. Healthcare workers who are properly protected will help to stop the spread of infection even when they are at a high risk of exposure.

## **Hypothesis of Study**

H1: Healthcare professionals who are properly protected reduce their exposure to infection when caring for patients with covid-19.

H2: Providing appropriate training to healthcare professionals to use personal protective equipment has a major role in protecting them.

H3: The availability of standard personal protective equipment, including protective suits, masks, gloves, goggles, face shields, and gowns contributes to protecting Healthcare professionals.

## **Importance of study**

Every single day, healthcare workers depend on personal protective equipment to keep themselves and their patients safe from the transmission of viruses and harmful diseases. However, PPE is now more crucial than ever due to the covid-19 epidemic that is spreading like wildfire.

Now, rather than talking about risk as a hypothetical worst-case scenario, healthcare practitioners realize the real consequence of not using PPE. Due to the fact that they encounter so many sick patients, healthcare workers are now the group most at risk for covid-19.

Even worse, when healthcare workers do get sick, their viral loads will be significantly higher than the normal person's, putting them at a far higher risk of incapacitating or deadly illnesses.

## **Objectives of study**

Main objective:

The main objective of the study is to investigate the protective effects of suitable personal protective equipment (PPE) for front-line medical staff who treat covid-19 patients.

Sub-objectives:

The problem of the current study can be summarized in the following objectives:

- To protect healthcare professionals and prevent the spread of covid-19.
- To provide adequate training for healthcare professionals in using personal protective equipment.
- The correlation between the benefit from further PPE training and using of recommended PPE, and confidence in using PPE.

## **Methodology**

The study consists of 95 questionnaires that were analyzed at various levels among healthcare professionals in Jeddah hospitals. These professionals ranged in age from 20 to 60 and had varying levels of education. Before recording the survey respondents' responses, all participants were verbally informed and given the opportunity to give their consent. Statistical analysis and Microsoft Excel were used to enter and evaluate the data.

## **Literature Review**

### **Use of PPE**

According to Stewart, Stewart et al., (2020) PPE is but one of the myriad factors in the effort to mitigate the transmission of hospital-acquired

infections. Other factors in transmission, include aerosol and droplet dynamics, infectious particle settling rate, ventilation, and air distribution patterns, humidity and temperature, number of infected, number of susceptible, length of exposure, type and degree of invasive procedures, UV light, and chemical exposure, and persistence of pathogens within a host. The use of PPE and to what extent PPE is used, however, can often be individually decided upon by physicians.

Assessment of Health Workers' Knowledge, Beliefs, Attitudes, and Use of Personal Protective Equipment for the Prevention of covid-19 Infection in Low-Resource Settings was carried out by Alao et al., (2020). 6.2% of the 290 participants that answered the survey had their responses discarded due to insufficient information. The study's participants had an average age of  $32.3 \pm 9.9$  years. A male-to-female ratio of 1 to 1.3 was achieved with 116 men (42.6%). Medical doctors made up 114 (41.9%) of the responses, followed by nurses and clinical students. The majority of responders (75.6%) came from tertiary healthcare facilities.

### **Risk to Healthcare Worker and COVID-19 infection control**

A study on the Risk to Healthcare Workers was conducted by Wu Z, McGoogan (2020). A recent report by the Chinese Center for Disease Control and Prevention revealed that just 3.8% of all cases involved healthcare workers. Despite 15% being categorized as severe or critical, the fatality rate was 0.2%. Healthcare workers' infection rates peaked at 29% early in the pandemic and then sharply declined after that. The PPE procedures put in place to adequately safeguard healthcare personnel are probably to blame for the fall in infection rates.

A study on knowledge of covid-19 infection control among medical staff in radiology departments in Saudi Arabia was conducted by Aljondi et al., (2021). A total of 1314 questionnaires were issued, and 256 participants answered the questions. 34 respondents (13% were radiographers), 160 (63% were radiologic technicians), 62 (24% were radiologists), 101 (39% were females), and 155 (61% were males) responded. Most of the participants were between the ages of 21 and 50, making up 95% of the sample. Of those, 104 (41%) had more than 10 years of experience, 53 (21%) had 1 to 5 years, and 59 (23%) had 6 to 10 years overall. The MOH provided the majority of the responses, totaling 132 (52%), while the other responses, totaling 124 (48%), came from the other five health sectors. 180 replies, or 70% of the total, came from facilities that treat covid-19 patients directly and are authorized to do so. Additionally, 205 (80%) of the participants stated that their healthcare institutions regularly teach staff members on infection prevention and control.

## **Theoretical Background**

### **Personal protective equipment**

According to the Occupational Safety and Health Administration (OSHA), personal protective equipment, or PPE, is specific clothing or equipment used by an employee to protect against infectious materials (Healthcare Settings, 2007).

Personal protection equipment (PPE) is worn by healthcare workers to reduce their exposure to dangerous substances or infectious microorganisms in the clinical setting. In addition to common precautions

like hand cleanliness, treating patients with communicable infections requires the use of transmission-based equipment such as gloves, gowns, and eye and mouth protection to stop the spread of a pathogen. PPE is the first line of defense for healthcare workers, along with appropriate patient isolation and strong administrative, environmental, and engineering controls (CDC, 2012).

### **Type of PPE**

The type of hazard, the area of the body protected, and the type of clothing or accessory are all ways to classify personal protection equipment. One piece of clothing, like boots, may offer several different types of safety: a steel toe cap and steel insoles to protect the feet from crushing or puncture wounds, impervious rubber and lining to keep out liquids and chemicals, high reflectivity and heat resistance to keep out radiant heat, and high electrical resistivity to keep out electric shock. It is necessary to contrast each piece of equipment's protective features with the potential workplace dangers. Although more breathable PPE may not result in an increase in contamination, it does increase user happiness (Verbeek et al., 2020).

### **Type of system that needs protection**

PPE will be categorized into the following categories for the purposes of this website: hearing protection, respiratory protection, body protection, hand protection, and eye and face protection. In the study we classed as a general 3 system, each category has its own matching safety equipment, which will be explained below.

## **1. Respiratory system**

Using a respirator helps to protect the user's respiratory system by preventing them from inhaling airborne pollutants. The two primary categories of respirators are. One form of respirator removes chemicals, gases, or airborne particles from the air the user breathes; the filtration might be passive or active (powered). This kind of respirator includes gas masks and particulate respirators (like N95 masks). The second kind of respirator safeguards users by supplying fresh air that can be inhaled from a different source. Self-contained breathing apparatus (SCBA) and airplane respirators fall under this category. When proper ventilation is unavailable or other engineering control measures are impractical or insufficient, respirators are used in work situations (Respirators Archived 2012).

## **2. Skin or body protection**

Skin dangers, which can result in occupational skin illnesses, can be divided into four areas. Contact dermatitis, skin cancer, and other skin injuries and infections are among the most prevalent and expensive occupational disorders. The skin can be exposed to chemical substances directly by contact with contaminated surfaces, aerosol deposition, immersion, or splashing. When the skin is exposed for an extended period of time to physical agents like high temperatures and ultraviolet or sun radiation, the skin may suffer damage. Abrasions, lacerations, contusions, friction, and pressure are all examples of mechanical trauma. When exposed to the skin, biological agents such as parasites, bacteria, plants, and animals can have a variety of consequences.

Skin protection can be referred to as any type of PPE that serves as a barrier between the skin and the exposure agent. Gloves are a necessity for skin protection because they are used so frequently for manual labor



and other hand-based tasks. Rubber gloves, cut-resistant gloves, chainsaw gloves, and heat-resistant gloves are a few types of gloves that are frequently used as PPE. Numerous types of gloves are used for protection during sports and other recreational activities, usually against mechanical injuries.

Any other item of clothing or protection used for a purpose serves to protect the skin in addition to gloves. For example, lab coats are worn to guard against potential chemical splashes. Face shields defend the face from probable collision dangers, chemical splashes, or potentially contagious fluid (CDC, 2012).

### **3. Eye protection**

Around 2,000 US workers suffer an eye injury at work every day that necessitates medical attention. A number of things can cause eye damage. The majority of eye wounds happen when solid objects like metal slivers, wood chips, sand, or cement fragments enter the eye. Eye injuries from particulate matter are also caused by smaller smoke particles and larger particles like shattered glass. When too much force comes into contact with the eye, blunt force trauma can happen. An industrial eye injury can also result from thermal agents, biological agents, and chemical burns from UV radiation and welding torches, among other sources.

#### **Types of PPE as general uses and med martial**

PPE comes in a variety of forms, including respirators, gowns, head coverings, gloves, goggles, and shoe covers. Face shields, gloves, eye protection, head coverings, gowns, and shoe covers all help prevent the spread of germs through direct contact and droplets, but in the medical field, we utilize six different kinds.

## 1. Eye and face protection

Numbers are terrifying! More than 600 workers worldwide experience eye injuries each day. Simply by donning the appropriate eye and face protection, such injuries can be prevented. The following can be mentioned as examples of such PPE:

Wearing eye protection that is specifically made to lower the danger of exposure to chemical splashes, laser radiation, and/or flying debris is how you safeguard your eyes. General safety glasses, laser safety glasses, chemical splash goggles, and impact goggles are the four main categories of eye protection, each of which has certain restrictions. Facial shields provide complete face protection.

## 2. Hand Protection

For hand protection, choosing the right gloves is crucial. One of the most crucial tools to reduce skin exposure to chemicals in research labs are chemically protective gloves. Given that no glove is chemically impermeable, they should only be used in the precise situations for which they were made.

## 3. Respiratory protection

Breathing apparatus, full-face or half-mask respirators, powered respirators, protective hoods, disposal face masks, detectors, monitors, etc. are all included within the category of respiratory protection. Ample instruction on how to utilize the equipment is always needed.

When coming into touch with copious amounts of gases, powders, dust, and vapours, this form of PPE is required. Respiratory protection equipment is only ever used as a "last line of defense," hence EH&S staff must assess each user individually and provide them with training. All

people who believe one or more of their job responsibilities necessitate the use of respiratory protection equipment are required to get in touch with EH&S since proper fitting and use are essential to respirator efficacy.

#### **4. Body Protection**

Every wet lab requires a lab coat. For labs, cotton or cotton/poly blends are adequate without posing a fire risk. When handling pyrophoric, flammable liquids in volumes greater than 4 liters or when working with flammable liquids and an ignition source, such as a burner, nomex coats are necessary. Wearing barrier clothing is required while handling infectious items. By putting barrier coats in a pan and adding a second pan of water to the autoclave, barrier coats can be autoclaved.

#### **5. Hearing Protection**

All laboratory staff must get in touch with EH&S to request noise monitoring in their work environments and receive advice on the proper use of hearing protection.

Laboratory employees will be engaged in the UC Merced Hearing Conservation Program if their eight-hour time-weighted average noise exposure is greater than the 85 dBA Action Level. These people will be subjected to yearly audiometric testing, be given access to hearing protection by their managers, and get instruction on how to properly fit, operate, and maintain these devices.

#### **6. Foot protection**

The foot protection device is made to shield the legs and feet from dangers including electricity, chemicals, intense heat, crushing, piercing, slipping, and cutting. It is generally necessary for users to handle large objects manually, participate in construction operations, operate in extreme cold or heat, handle chemicals, or work in forests.

Among the foot protection gear examples are the following ones:

- Safety boots and shoes
- Anti-static and conductive footwear

### **Personal Protective Equipment for Infection Control**

Protective clothes, helmets, gloves, face shields, goggles, facemasks, respirators, and other items that screen the wearer from harm or the spread of disease are all examples of personal protective equipment (PPE).

In healthcare facilities including hospitals, doctor's offices, and clinical labs, PPE is frequently used. When worn correctly, PPE creates a barrier between your skin, mouth, nose, and eyes and infectious substances like bacteria and viruses (mucous membranes).

The barrier may prevent the spread of pollutants from respiratory secretions, bodily fluids, or blood. PPE may also guard against exposure to substances or possibly infectious material brought in by visitors and healthcare personnel for patients who are at high risk of getting infections during surgery or who have a medical condition like an immunodeficiency. It reduces the transfer of infection from one person to another when used correctly and in conjunction with other infection

control techniques including hand washing, using alcohol-based hand sanitizers, and covering coughs and sneezes. In order to effectively use PPE and prevent infecting both the user and others, dirty PPE must be removed and properly disposed of (FDA, 2020).

## **The important PPT uses in the medical healthcare**

### **1. N95 Respirators**

Personal protection equipment, such as N95 respirators and surgical masks, shields the user from liquid splashes on the face and airborne contaminants. N95 respirators are also subject to regulation by the Occupational Safety and Health Administration (OSHA), National Institute for Occupational Safety and Health (NIOSH), and the Centers for Disease Control and Prevention (CDC). It is crucial to understand that using PPE alone will not effectively prevent airborne transmission; rather, a combination of interventions from several levels of the hierarchy of controls must be used (FDA, 2020).

### **2. Medical Gloves**

In order to prevent the spread of infection or illness during medical operations and examinations, personal protection equipment such as medical gloves is worn by the wearer and/or the patient. One element of an infection-control plan is the use of medical gloves. Exam gloves, surgical gloves, and gloves for handling chemotherapeutic drugs are all types of disposable medical equipment (chemotherapy gloves). These gloves must submit a 510(k) premarket notification since they are

classified by the FDA as Class I restricted medical devices. To make sure that performance standards including leak resistance, rip resistance, and biocompatibility are satisfied, FDA evaluates these devices. When handling certain dangerous substances, some possibly contaminated objects, or someone else's bodily fluids (such blood, respiratory secretions, vomit, urine, or feces), wear medical gloves (FDA 2020).

### **3. Medical Gowns**

Personal protective equipment, or PPE, is frequently utilized in healthcare settings. In the event that the wearer comes into touch with potentially contagious liquid and solid material, they are used to shield the user from the transmission of infection or disease. They could also be used to assist stop the person wearing the robe from spreading germs that might damage more susceptible patients, like those with compromised immune systems. One element of a comprehensive infection-control plan is the use of gowns.

Surgical gowns, isolation gowns, surgical isolation gowns, nonsurgical gowns, procedural gowns, and operating room gowns are just a few of the many names that have been used to describe gowns meant for use in healthcare settings.

The American National Standards Institute/Association for the Advancement of Medical Instrumentation (ANSI/AAMI) consensus standard PB70:2003, "Liquid barrier performance and classification of protective apparel and drapes intended for use in health care facilities," was recognized by the FDA in 2004. The standard uses new terminology to describe the barrier protection levels of gowns and other protective

clothing intended for use in healthcare facilities. It also outlines the test procedures and performance metrics required to confirm and validate that the gown provides the newly defined levels of protection (FDA 2020).

- Level 1: Minimal risk, to be used, for example, during basic care, standard isolation, cover gown for visitors, or in a standard medical unit
- Level 2: Low risk, to be used, for example, during the blood draw, suturing, in the Intensive Care Unit (ICU), or a pathology lab.
- Level 3: Moderate risk; applicable during, for instance, the arterial blood draw, the insertion of an intravenous (IV) line in the emergency room, or in trauma situations
- Level 4: High risk, utilized, for instance, during prolonged, fluid-intensive procedures, during surgery, when pathogen resistance is required, or when infectious illnesses are suspected (non-airborne)

Whatever the product's name—isolation gown, procedure gown, or cover gown—look for product labeling that specifies an intended function and the needed level of protection based on the aforementioned risk factors when picking gowns. Product names do not follow any standards (FDA 2020).

### **Personal Protective Equipment and Covid-19**

It is crucial to stress the use of appropriate precautions for infection management in hospital settings given the threat posed by coronavirus

illness 2019, or Covid-19. The virus that causes Covid-19 is known as SARS-CoV-2, or severe acute respiratory syndrome coronavirus 2. 1 Direct contact, or coming into touch with respiratory droplets and aerosols from an infected person, as well as indirect contact, such coming into contact with contaminated surfaces or supplies, are the two main ways that SARS-CoV-2 is transmitted (van Doremalen et.al 2020).

PPE donning and doffing, often known as donning and doffing, instruction and competency demonstration are the greatest ways for healthcare workers to prevent SARS-CoV-2 infection (PPE). You should adhere to the instructions provided by your institution and the Centers for Disease Control and Prevention (or CDC) when putting on and taking off PPE. The CDC has advised using one type of PPE in U.S. hospitals to reduce the risk of exposure to infectious material when caring for patients with Covid-19, and this video shows how to put it on and take it off (Centers for Disease Control and Prevention. Coronavirus disease 2019).

### **Personal protective equipment during the COVID -19 pandemic**

During the present coronavirus (covid-19) epidemic, personal protective equipment has grown in importance and emotional resonance. Most contact or droplet transmission of covid-19 is due to relatively large respiratory particles that are subject to gravitational forces and move just one meter away from the patient. If a patient's respiratory activity or a medical procedure produces respiratory aerosols, airborne transmission may happen. These aerosols contain particles, which may be airborne for a longer period of time and travel farther, but their potential for infection is unknown. When performing airway maneuvers on infected



patients, particularly when doing tracheal intubation, consideration should be given to contact, droplet, and airborne transmission.

Personal protective equipment is an essential feature of a system that safeguards personnel and other patients from covid-19 cross-infection, but it is only one part of the puzzle. The danger of viral transmission is considerably decreased with appropriate use. According to logic, personal protective equipment should be matched to the likely viral transmission mode—contact, droplet, or airborne—occurring during patient care. While equipment use is inconsistent, international organizations' recommendations are often consistent. A fitted high-filtration mask is only included in airborne precautions, and it should only be used during procedures that produce aerosols. Certain aspects of personal protective equipment, such as the use of hoods, the type of mask, and the possibility of equipment reuse, are still under question (T. M. Cook.2020).

## Results

Table 4.4 percentage of PPE do you use

PPE do you use	Percent	No.
Surgical mask	52.60%	50
N95 mask. N95	72.60%	69
Eye protection: Goggles	33.70%	32
Eye protection: Face shield	64.20%	61
Apron, Gowns	65.30%	62
Gloves	90.50%	86
Shoe cover	50.50%	48
Hair cover	53.70%	51
Total respondents		95

The frequency and percentage of PPE used at the hospital are shown in Table (4.4), with the most frequently used PPE being gloves, N95 masks, aprons, gowns, eye protection, and face shields.

Table 4.5 percentage of PPE currently unavailable

<b>PPT currently unavailable</b>	<b>Percent</b>	<b>No.</b>
Surgical mask.	17.90%	17
N95 mask. N95	45.30%	43
Eye protection	44.20%	42
Eye protection: Face shield.	34.70%	33
Apron, Gowns.	18.90%	18
Gloves.	16.80%	16
Shoe cover.	47.40%	45
Hair cover.	32.60%	31
Total respondents		95

According to table (4.5), there is a shortage of some protective gear, including N95 masks, eye protection, and shoe covers. The recommendations for this research to deliver this equipment are permeated by these findings.

Table 4.6 percentage PPE available to you is adequate to protect you

<b>PPE available to you is adequate to protect you</b>	<b>Percent</b>	<b>No.</b>
Not confident at all.	4.20%	4
A little confident.	20.00%	19
Somewhat confident.	31.60%	30
Confident.	25.30%	24
Very confident	18.90%	18
Total respondents		95

The results showed a high awareness and confidence in the facility's capabilities in providing PPE, as the percentage of trust was high among the participants, Somewhat confident, Confident, and Very confident 31.60%, 25.30%, and 18.90% respectively. Table (4.6) shows the

frequency and the percentage of requested PPE that is adequate to protect you.

Table 4.7 percentage of training in the use of the recommended PPE at your hospital

<b>Training in the use of the recommended PPE at your hospital</b>	<b>Percent</b>	<b>No.</b>
Yes, when starting work in my current hospital.	35.80%	34
Yes, due to the spread of the COVID-19 pandemic.	33.70%	32
Yes, at another time before the COVID-19 pandemic.	13.70%	13
No.	16.80%	16
Total respondents		95

The presentation of instructions on the use of the advised PPE at your hospital is shown in Table (4.7). The findings of the present study were consistent with those of earlier studies; only 35.8% of participants had received direct instruction from their healthcare institute regarding the use of personal protective equipment (PPE) and safety in a pandemic situation prior to this investigation (Kotian et al., 2020) conducted a study on medical imaging professionals' awareness and understanding of COVID-19, and they found that only 46.5% of participants had received instruction in the safe use of PPE (Kotian et al., 2020).

Table 4.8 percentage of benefit from further PPE training

<b>Benefit from further PPE training</b>	<b>Percent</b>	<b>No.</b>
Yes, didactic teaching and printed materials.	18.90%	18
Yes, demonstration by infection control experts.	49.50%	47
Yes, simulation-based training.	21.10%	20
No	10.50%	10
Total respondents		95

The Presenting Benefit of Additional PPE Training is Almost in Agreement with According to a survey by Modi et al., (2020) among healthcare professionals and students in the Mumbai metropolitan area,

49.5% of respondents were able to correctly don and take off the PPE as demonstrated by infection control specialists. About 10% of the research population properly answered the questions, which led to slightly better outcomes in the current study. However, there is still a need for comprehensive instruction and briefing of the healthcare staff regarding the various safety aspects of the use of PPE, such as using the appropriate PPE kit for a different scenario, the order of donning and doffing soiled PPE, standard etiquette while using PPE, and maintaining personal hygiene (Modi et al., 2020).

Table 4.9 percentage of testing for a N95

Testing for a N95	Percent	No.
Yes, when starting work in my current hospital.	28.40%	27
Yes, due to the spread of the COVID-19 pandemic.	20.00%	19
Yes, at another time before the COVID-19 pandemic.	14.70%	14
No.	36.80%	35
Total respondents		95

Testing results are presented in Table (4.9) for an N95. The results showed There is not enough test to wear an N95 and the percentage is high was 36%.

Table 4.10 percentage of confident used of PPE

Confident used of PPT	Percent	No.
Not confident at all	3.20%	3
A little confident	20.00%	19
Somewhat confident	31.60%	30
Confident	27.40%	26
Very confident	17.90%	17
Total respondents		95

Table (4.10) displays the confidence presentation when using high-quality PPE. The results were 31% somewhat confident and 27%

confident. This study demonstrates that healthcare workers are generally aware of the need for personal protective equipment (PPE), but they lack in-depth knowledge of how to handle and discard used PPE, which is essential in a pandemic situation like the covid-19 outbreak. These findings are consistent with many previous studies.

Table 4.11 correlation between benefit from further PPE training and using of the recommended PPE

Correlations between benefit from further PPE training and using of the recommended PPE			
		benefit from further PPE training	using of the recommended PPE
benefit from further PPE training	Pearson Correlation	1	1.000**
	Sig. (2-tailed)		.001
	N	95	95
Presenting of training in the use of the recommended PPE	Pearson Correlation	1.000**	1
	Sig. (2-tailed)	.001	
	N	95	95

\*\*Correlation is significant at the 0.01 level (2-tailed).

According to Table (4.11), there is a strong correlation between the benefit of additional PPE training and the proportion of training in the use of the required PPE. This correlation is strong and highly significant at the level of 0.001.

Table 4.12 correlation between benefit from further PPE training and confident used of PPE

Correlations between benefit from further PPE training and confident used of PPE		
	benefit from further PPE training	confident used of PPE

benefit from further PPE training	Pearson Correlation	1	.025
	Sig. (2-tailed)		.968
	N	95	95
Confident used of PPT	Pearson Correlation	-.025	1
	Sig. (2-tailed)	.968	
	N	95	95
Correlation is significant at the 0.1 level (2-tailed).			

There is a small but statistically significant association between the advantages of further PPE training and the confident use of PPE, as shown in Table (4.12).

## Conclusion

The WHP has established safety safeguards and protocols for dealing with patients who have covid-19, although occupational risks still exist for healthcare personnel. The PPE is the sole thing separating the healthcare personnel from covid-19. In-depth PPE training is crucial to help frontline healthcare workers obtain the skills and awareness they will need in the current pandemic crisis because the study's findings show that healthcare workers have insufficient training and knowledge.

The study consists of 95 questionnaires analyzed at different levels among the professionals in healthcare their ages ranging from 20-60 years, they had different levels of education, Inform all, survey participants verbally to obtain their consent before recording the information that used in this study. The study consists of 95 questionnaires of healthcare professionals in Jeddah Hospitals. The

researcher use an online questionnaire to collect data on clinical practice due to the precautionary measures. The questionnaire consisted of objective questions related to daily clinical practice in following the protocol for standard personal protective equipment to reduce the rate of spread of infection.

The result of the research shows that 49.5% of men and women who works in hospitals need more training by infection control experts to increase their knowledge about the right sequence of donning and doffing of soiled PPE, standard etiquette while using PPE, and maintaining personal hygiene. And the correlation between the benefit of further PPE training and using of recommended PPE, and confidence in using it.

The researcher recommends the following:

- Extensive health worker training programs.
- Before any pandemic, educational healthcare facilities must be completely developed, utilizing medical technology and offering training to all medical staff.
- Increase the databases and analysis, as well as the expansion of research.

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