

## Awareness and Preparedness of Egyptian House Officers toward COVID-19 Pandemic

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### Abstract

**Background:** The recent spread of coronavirus disease-2019 (COVID-19) led to shortage of health care providers in all countries. House officers and medical students may have a role in solving this problem.

**Objective:** The study aims to measure and discuss the readiness of Egyptian house to be part of the health system facing the current COVID-19 pandemic.

**Methods:** A cross-sectional online questionnaire was conducted on sample of house officers from different Egyptian universities through announcement on social media groups over a period of one month during May 2020.

**Results:** Nine-hundred seventy four Egyptian house officers participated in this study. Only 38.8% of respondent agreed to be a member of COVID-19 management team, 70.4% of participants depend on social media as a source for their information. The analysis of the results shows that participants significantly need more information about the protective measures and how to report suspected cases.

**Conclusions:** Egyptian house officers need more training before being involved in the health care system for facing COVID-19.

**Keywords:** awareness; COVID-19; house officers; Health care

### Introduction

The recent outbreak of coronavirus disease-2019 (COVID-19) has gained attention globally. It has been recognized as a serious public health threat by the US Centers for Disease Control and Prevention (CDC) and as a global pandemic by WHO [1]. All countries are fighting with all means

they have to limit the spread of this disease. Numbers of COVID-19 cases and deaths are increasing all over the world, which requires improving the quantity and quality of medical staff. The shortage of healthcare providers became a critical problem [2].

As a solve, house officers and medical students all over the world are

being fast-tracked into early service support health systems. For example, In Italy and Denmark, Medical school graduates will be able to start working as fully-qualified doctors immediately after providing practical training on the procedures students should follow to isolate suspected cases, use ventilators, and how to apply infection control measures [3, 4]. At the same time, The American Association of Medical Colleges (AAMC) recommended that medical students shouldn't be involved in any direct patient care activities unless there is a critical health care workforce need [5].

In Egypt, the Ministry of Health recommended starting training of the Egyptian house officers (medical students who finished studying medicine and in their last training year) to be a part of the healthcare system. Egyptian Higher Education and Scientific Research Ministry has launched the "Be Ready" initiative for junior doctors and medical students. The initiative aims to prepare "a second defense line of qualified doctors." The ministry added that several faculties of Medicine nationwide began organizing training programs for some senior volunteer students and medical interns.

These trainings include how to deal with infected patients, how to safely home-isolate suspected cases, how to prevent infection among patients and medical staff in hospitals, how to test patients, and how to use ventilators [6]. Information about Egyptian house officers' preparedness and awareness for combating the COVID-19 is not known and that we tried to evaluate in the present study.

## Materials and Methods

### Participants

The present study was a cross-sectional online questionnaire survey. The convenient sample of house officers from different universities across the country were recruited through an announcement on social media groups. Data collection was done over one month (May 2020). Informed consent was acquired before each participant administered the questionnaire online. Therefore, participants were introduced to the study's purpose and contents before answering the questions.

After they were fully instructed, they carried on fulfilling the questions online based on their own willingness. We add an item of participant code (formed of the first three letters of his/her name and last three characters of his/her phone number) to prevent duplication. Before we present the questionnaire to the participant, we sent it to four house officers and asked them to answer it. We asked them about the clarity of the questions to ensure that all the questions are understandable.

Participants were from 22 medical schools across the country. The medical schools were divided according to its place into Great Cairo universities (Ain Shams, Cairo, Helwan, and Al-Azhar), Lower Egypt universities (Alexandria, Banha, Damietta, Kafrelsheikh, Mansoura, Minufiya, Port Said, Suez Canal, Suez, Tanta, and Zagazig) and Upper Egypt universities (Assiut, Aswan, Beni-Suef, Fayoum, Minia, Sohag, and South Valley).

### Questionnaire Development

The authors developed the study questionnaire after a literature review. It has consisted of 17- items divided over three parts. The first part includes participants' gender, university and their agreement to be part of COVID-19 teams. The second part includes questions about the source of their information about COVID-19, attendance of any online courses or specialized training by the university, their perception of their skills if qualified to deal with COVID-19 cases or not, and availability of personal protective equipment (PPE) in hospitals.

The third part includes a question about their knowledge about symptoms, investigations, when to suspect a case, proper use of PPE, isolation of suspected cases, prevention of transmission from an infected patient, protective measures during procedures as cardiopulmonary resuscitation (CPR), endotracheal intubation (ETT) and tracheostomy for COVID-19 patients, reporting of cases and Egyptian management protocol.

### Data Analysis

Analysis of data was done using the statistical software package IBM SPSS Statistics version 20. Variables were expressed as frequency and percentage. A

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Chi-square test was used to compare variables. The level of significance "P" value was evaluated, where P value < 0.05 was considered statistically significant.

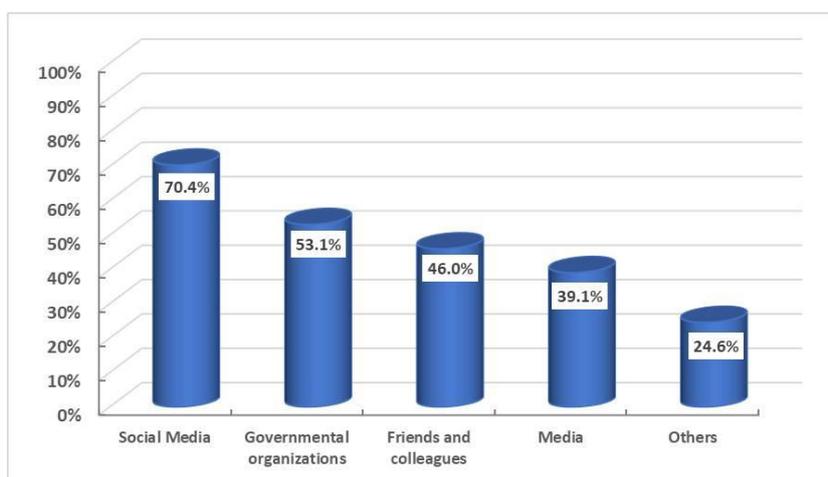
### Results

The number of respondents was 974 house officers. About half of the sample

was from Lower Egypt universities (51.2%), 30.4% from Great Cairo, and 18.4% from Upper Egypt universities. Males represented 41.3% of the sample. Only 38.8% of respondent agreed to be a member of the COVID-19 management team in the country. (**Table 1**)

**Table(1):** Basic Characteristics of respondents (n=974)

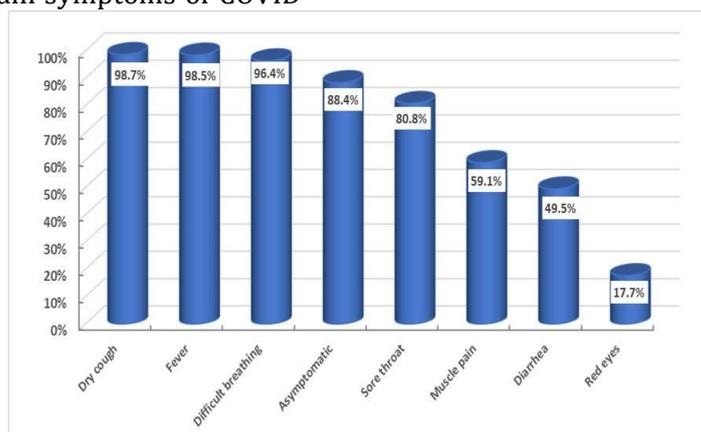
| Variable   | Frequency | %    |
|--|-----------|------|
| <b>University Site</b>                           |           |      |
| Great Cairo                                      | 296       | 30.4 |
| Lower Egypt                                      | 499       | 51.2 |
| Upper Egypt                                      | 179       | 18.4 |
| <b>Gender</b>                                    |           |      |
| Male   | 402       | 41.2 |
| Female   | 572       | 58.7 |
| <b>Agreement to be a member of COVID-19 team</b> | 378       | 38.8 |



**Figure (1):** Source of information about COVID-19.

Regarding information source, 70.4% reported social media as Facebook, Instagram, ... etc, 53.5% from a governmental organization as Ministry of Health, 46% from their friends and colleagues, 39.1% from media as TV and radio channels (**figure 1**). Most of them reported dry cough, fever, and difficult breathing as the main symptoms of COVID-

19 (98.7%, 98.5%, and 96.4%, respectively). Also, a large proportion of them were aware that patients may be asymptomatic (88.4%), have a sore throat (80.8%), or muscle pain (59.1%). Diarrhea was reported by 49.5% of them as a representing symptom, while red-eye reported by 17.7% only (**figure 2**).

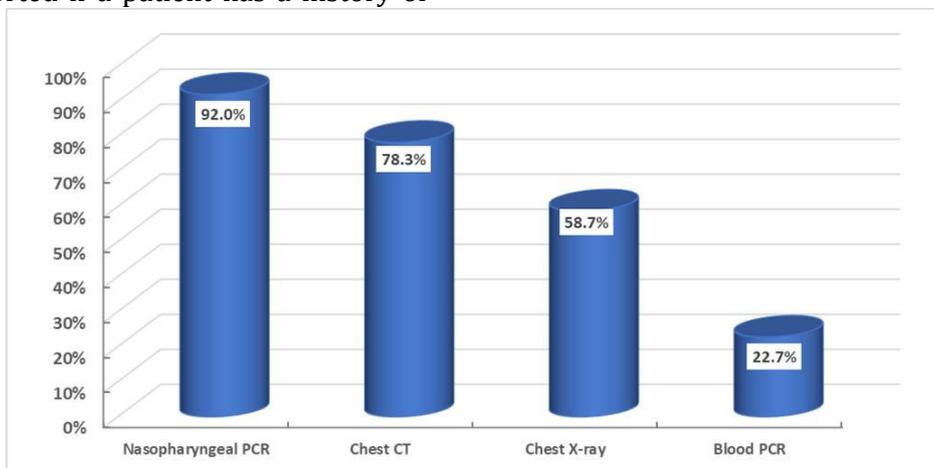


**Figure(2):** Knowledge of COVID-19 symptoms.

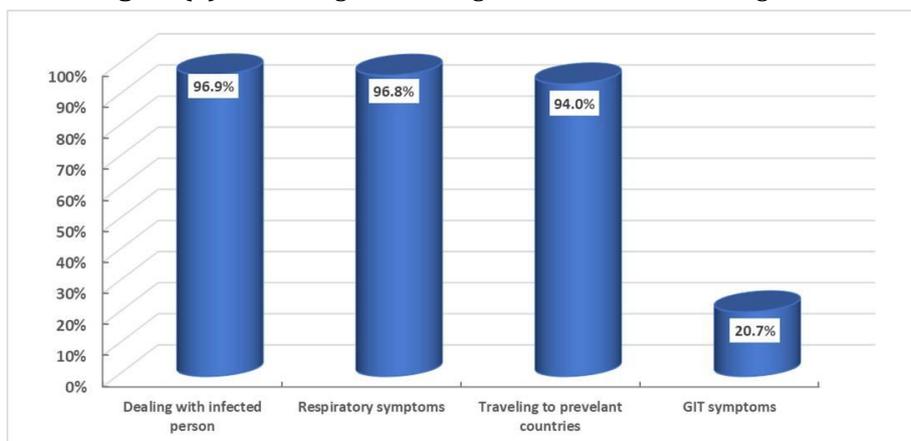
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For investigations used in diagnosis, 92% reported PCR of nasopharyngeal swab followed by chest CT (78.3%) while chest x-ray reported by 58.7% and PCR of blood sample by 22.7% (**figure 3**). When asking about factors that make them suspect that the patient may have COVID-19, most of them reported if a patient has a history of

dealing with an infected patient, respiratory symptoms or history of recent traveling to countries known to have infected patients (96.9%, 96.8%, and 94% respectively). Only 20.7% reported the presence of gastrointestinal symptoms as a suspicion factor (**figure 4**).



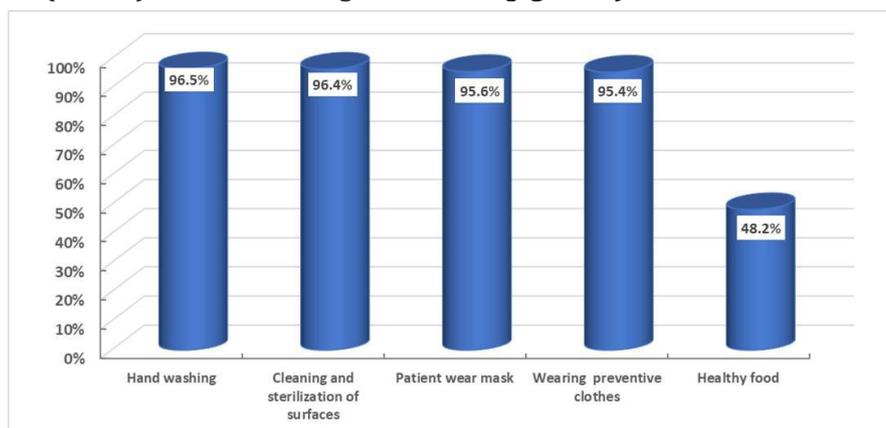
**Figure (3):** Knowledge of investigations for COVID-19 diagnosis.



**Figure (4):** Knowledge of suspicious criteria of COVID-19 cases.

Most of the respondents reported that repeated hand washing (96.5%), cleaning and sterilization of all surfaces touched by patients (96.4%), mask-wearing for patients (95.6%) and wearing of

preventive clothes by medical staff (95.4%) as measures that may help to prevent transmission and 48.2% reported eating healthy food as a preventive measure (**figure 5**).



**Figure (5):** Knowledge of measures that prevent transmission of infection from COVID-19 cases.

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From all respondents, only 11.9% thought that they are qualified to deal with COVID-19 cases. For their preparedness for the COVID-19 situation, only 22.9% attended online courses, and 31.5% received specialized training by their universities. When asked about Egyptian management protocol, most of them knew it but not in detail (61.6%). For the use of PPE, 32.1% knew how to use it, and about half of them (54.3%) need more information for how to use it when dealing with suspected patients, while 60.7% reported that the PPE was not available enough. For isolation of suspected cases, 20.5% knew how to do it, and 49.6% need more information. Near half of the

participants (46.4%) did not identify the protective measures that should be taken when performing CPR, endotracheal intubation, or tracheostomy for COVID-19 patients. For suspected cases, 54.8% of them knew how and for whom they should report.

For all of the above-mentioned preparedness criteria, there was no significant difference between respondents from different universities except for knowledge about preventive measures for procedures as CPR and how to report suspected cases in which house officers of great Cairo universities showed more knowledge ( $p < 0.001$ ) (**Table 2**).

**Table (2):** Factors reflects preparedness of respondents for dealing with COVID-19 cases

|  | University site |             |             | Total       | P-value  |
|--|-----------------|-------------|-------------|-------------|----------|
|  | Great Cairo     | Lower Egypt | Upper Egypt |             |          |
| <b>Thought he/she is qualified</b>                           |                 |             |             |             |          |
| No   | 263 (88.9%)     | 441 (88.4%) | 154 (86%)   | 858 (88.1%) | 0.630    |
| Yes  | 33 (11.1%)      | 58 (11.6%)  | 25 (14%)    | 116 (11.9%) |          |
| <b>Attend online courses</b>                                 |                 |             |             |             |          |
| No   | 229 (77.4%)     | 387 (77.6%) | 135 (75.4%) | 751 (77.1%) | 0.837    |
| Yes  | 67 (22.6%)      | 112 (22.4%) | 44 (24.6%)  | 223 (22.9%) |          |
| <b>Attend special training</b>                               |                 |             |             |             |          |
| No   | 207 (69.9%)     | 345 (69.1%) | 115 (64.2%) | 667 (68.5%) | 0.391    |
| Yes  | 89 (30.1%)      | 154 (30.9%) | 64 (35.8%)  | 307 (31.5%) |          |
| <b>Egyptian management protocol</b>                          |                 |             |             |             |          |
| No   | 81 (27.4%)      | 106 (21.2%) | 44 (24.6%)  | 231 (23.7%) | 0.052    |
| know it well   | 32 (10.8%)      | 88 (17.6%)  | 23 (12.8%)  | 143 (14.7%) |          |
| Not in details   | 183 (61.8%)     | 305 (61.1%) | 112 (62.6%) | 600 (61.6%) |          |
| <b>PPE availability</b>                                      |                 |             |             |             |          |
| Available profusely  | 4 (1.4%)        | 6 (1.2%)    | 2 (1.1%)    | 12 (1.2%)   | 0.308    |
| Available enough   | 22 (7.4%)       | 62 (12.4%)  | 16 (8.9%)   | 100 (10.3%) |          |
| Not available enough   | 181 (61.1%)     | 293 (58.7%) | 117 (65.4%) | 591 (60.7%) |          |
| Not available for me   | 89 (30.1%)      | 138 (27.7%) | 44 (24.6%)  | 271 (27.8%) |          |
| <b>Proper use of PPE</b>                                     |                 |             |             |             |          |
| No   | 45 (15.2%)      | 63 (12.6%)  | 24 (13.4%)  | 132 (13.6%) | 0.611    |
| Yes  | 94 (31.8%)      | 155 (31.1%) | 64 (35.8%)  | 313 (32.1%) |          |
| Need more information  | 157 (53%)       | 281 (56.3%) | 91 (50.8%)  | 529 (54.3%) |          |
| <b>Know how to isolate suspected cases</b>                   |                 |             |             |             |          |
| No   | 93 (31.4%)      | 146 (29.3%) | 52 (29%)    | 291 (29.9%) | 0.338    |
| Yes  | 64 (21.6%)      | 92 (18.4%)  | 44 (24.6%)  | 200 (20.5%) |          |
| Need more information  | 139 (47%)       | 261 (52.3%) | 83 (46.4%)  | 483 (49.6%) |          |
| <b>Know the protective measures of procedures (e.g. CPR)</b> |                 |             |             |             |          |
| No   | 87 (29.4%)      | 274 (54.9%) | 91 (50.8%)  | 452 (46.4%) | < 0.001* |
| Yes  | 66 (22.3%)      | 57 (11.4%)  | 24 (13.4%)  | 147 (15.1%) |          |
| Need more information  | 143 (48.3%)     | 168 (33.7%) | 64 (35.8%)  | 375 (38.5%) |          |
| <b>Know how to report cases</b>                              |                 |             |             |             |          |
| No   | 104 (35.1%)     | 242 (48.5%) | 94 (52.5%)  | 440 (45.2%) | < 0.001* |
| Yes  | 192 (64.9%)     | 257 (51.5%) | 85 (47.5%)  | 534 (54.8%) |          |

\*significant p-value

### Discussion

COVID-19 is a pandemic that has set a new normal to the way of living. While some countries managed to control the first wave of the pandemic and set up measures to brace for the second wave, others are still suffering from mass casualties among health care front-liners in addition to their populations. Consideration was given to use medical and nursing students to increase the workforce in the war against the pandemic by some countries. In overwhelmed healthcare systems in developed countries, medical education authorities expedited the transition of final year medical students and foundation year doctors to fresh graduates to aid in the crises [7-9].

In India, the health ministry suggested issuing provisional permits for clinical medical undergraduates to treat COVID-19 patients, thus extending care to a huge affected fraction of the population [10].

In Egypt, the medical education system consists of a seven-year curriculum. The final year medical student is called a "house officer" in the Egyptian Medical Education system, which is equivalent to an intern or foundation year doctor dedicated to clinical medicine practice under supervision. There are around 23 medical schools in Egypt with about 7000 house officers that graduate annually. In Egypt, the country was shocked by the death of a house officer last June who contracted COVID-19 while volunteering at a community hospital to aid his colleagues despite his family warnings to stay safe [11]. Our study aimed to assess the knowledge and preparedness of Egyptian house officers to play an active role in the health care system fighting the COVID-19 pandemic. Besides, our research aimed to shed some light on the debate about enrolling house officers and medical students in the fight against COVID-19 and how to better use their skills safely and efficiently during the pandemic.

#### Knowledge and Sources of Information

Prolonged lockdown made health care providers seek updated scientific evidence regarding COVID-19 among social media platforms, and house officers are not an exception. However, social media can

also convey rumors and misinterpreted information. House officers may lack the experience and scientific knowledge at the beginning of their careers to differentiate between them and reliable scientific information.

A recent study reported that health care providers and medical students sought updated information regarding COVID-19 through social media [12]. Our study demonstrated that Egyptian house officers used social media as a primary source of information about COVID-19 nearly the same as their peers in some countries [9, 13]. This finding is essential for the ministries of information and health to utilize social media platforms better to deliver updated evidence-based information concerning COVID-19 to health care providers [14].

Health care providers, particularly clinical medical students, are at risk of infectious diseases, and the COVID-19 pandemic has increased this risk dramatically. Thus, those at the front lines must have the proper knowledge about disease transmission, diagnosis, and methods of prevention. Assessing their knowledge will help stakeholders properly plan where house officers will be of more considerable aid in this crisis [15]. Besides, knowledge assessment of precautionary measures to avoid being infected will help to design the educational content that will shape their future behavior in the pandemic.

A study in China demonstrated that clinical medical students scored high in knowledge about COVID-19 in comparison to those in the basic learning years [16]. While in Iran, a study reported that their medical students scored high in knowledge in contrast to studies conducted on health care providers [15]. Similarly, in our research Egyptian house officers proved a high level of knowledge regarding COVID-19, indicating their awareness about seeking reliable information sources about the pandemic.

#### Preparedness to Face the Pandemic

House officers have volunteered to assist in their communities and provide medical help in a small hospital all over the world since the beginning of the COVID-19

pandemic. This attitude reflects their enthusiastic attitude about becoming professional health care providers and has incited health authorities to consider deploying them as active players in this war.

A few studies in the literature investigated the house officers' attitudes to assess if they were adequately prepared to face the pandemic or not. In a study in China, clinical medical students (47%) were willing to volunteer to help the sick in their community hospitals. In comparison, more than 80% were willing to support the front lines workers out of their responsibilities as doctors [16]. Another study in Uganda reported that around 80% were ready to join the frontline fighting COVID-19 [9]. While a study conducted in India stated 70% of Indian medical students were reluctant to attend clinics for fear of getting infected or passing the infection to others [13]. Our study reported that around 40% of house officers agreed to join the frontlines as COVID-19 management team members. We believe that this percentage does not reflect the lack of eagerness. Still, it stems from their answers that the majority was not well prepared by their universities to properly face the pandemic in terms of specialized training regarding dealing with suspected COVID-19 patients.

Several studies reflected the debate between health authorities in different countries on how house officers/interns, in addition to medical students, can help their overwhelmed health care systems in the pandemic. One opinion is that house officers can be trained to acquire specific skill sets to help their communities where there is a shortage of health care providers in non-COVID settings as care of non-infected patients under guidance, assistance to health care providers, part of primary care services as screening, and public education programs. The perks of this concept are numerous as their medical education will not be interrupted, they will develop additional skills, and notably, they will serve their communities hence fighting the stigma about the disease [17].

Another opinion that was proposed by some health care authorities is to make house officers and final year medical students serve among front line teams against COVID-19. So, in some countries like

India, the health authority suggested issuing provisional licenses to treat COVID-19 patients. In contrast, in other countries as the United Kingdom, government agencies considered expediting graduation exams and registration procedures [10, 13]. Shifting the role of house officers to be in the frontlines puts them at even higher risk of contracting the infection owing to novice clinical experience and not being trained adequately to manage patients with COVID-19 as we demonstrated. Besides, expediting their role to become active health care workers may affect them in the long term because of interruption of their studies or hastening the transition will change their core knowledge to become reliable health care professionals. While these are unprecedented circumstances affecting the whole globe, the consequences may be dire, and the decision should be weighed carefully.

### Study Limitations and Strengths

We formulated a knowledge assessment tool for our study, so the non-availability of a validated assessment tool among this population may represent a drawback of our study. The data presented in this study are self-reported and partly dependent on the participants' honesty, so it is liable to recall bias. To our knowledge, this is the first study examining the knowledge of Egyptian house officers and their preparedness to be part of COVID-19 management teams. The strength of our study lies in that the participants' answers were anonymized. The survey was disseminated online, and it is easily accessible. Other study strengths are that the study included house officers from the majority of Egyptian universities, so our sample population is from different geographic regions covering the whole country, and also, it reflects the similarity in practice across the nation's medical education system.

### Recommendations and Conclusions

Overall, Egyptian house officers demonstrated a high level of knowledge regarding COVID-19 and utilization of social media hubs as a primary tool in obtaining scientific information about the pandemic. The holdback of a good ratio of Egypt house officers to participate in the frontline teams

is reflected by their desire to be appropriately trained to manage COVID-19 patients competently in the field. Medical students and house officers represent a vulnerable group in the health care field, and designing educational interventions and training programs on infection control practices for COVID-19 addressing them is a mandatory requirement before considering them to play a role in this war. Social media can be a powerful tool to help them continue medical education during the pandemic at education interruption periods in addition to delivering public health education programs as well.

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