The worldwide contribution of medical students during the COVID-19 pandemic: quantitative and qualitative research

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Abstract

Background

One of the biggest concerns regarding the COVID-19 pandemic is the extreme demand for health care workers and health systems. Medical students possess a range of skills and attributes that can help the declining workforce. This paper aims to provide an overview of the roles medical students have taken during this pandemic worldwide and provide insights to work towards establishing safe, efficient and useful roles during the progression of the pandemic.

Methods

A comprehensive questionnaire was distributed through social media using platforms and networks that involved medical students worldwide. Analysis of the data included both quantitative and qualitative methods. Qualitative data of multiple-choice questions was done to calculate the percentage of countries in which students played a role during the pandemic, whether they were paid, and if medical education was suspended. Furthermore, we identified the different roles medical students had across the globe. Qualitative analysis was performed on blank space questions to gain more insights regarding the roles of medical students across different countries.

Results

144 responses were reported from 47 countries and 81 different universities, representing all United Nations Regions. The role of medical students was most reported as providing medical assistance, namely in 61.7% of countries. Other reported roles were helplines, no role, logistical assistance, testing, baby-sitting, awareness, triage and supporting a physician at home. In 7.5% of the countries where students are performing services, it is reported these are paid services. In 45.7% (n = 37) of all universities, medical schools have been suspended with no reported (online) alternative for classes or exams.

Conclusions

Our results show that medical students have the capability to contribute in many different ways during this pandemic. In most cases, roles are unpaid and many reports show that there is no clarity on whether their roles will count towards their educational credits. It is crucial to develop adequate protocols and statements, so medical students can contribute to the best of their capacity and in a safe, ethical and healthy manner during the pandemic, for which additional research and collaboration between institutions is needed.

Background
On the 11th of March 2020, the Director-General of the World Health Organization (WHO) characterized the Coronavirus Disease 2019 (COVID-19) as a pandemic. He commented on the WHO’s concern based on the levels of spread and severity of the disease, but also based on the ‘alarming levels of inaction’. At that point in time, there were over 118,000 cases in 114 countries, with a total of 4291 deaths. (1)

One of the biggest concerns regarding this pandemic is the extreme demand for health care workers and pressure on health systems. Shortages in tests and medical support in the form of Intensive Care Unit (ICU) beds, ventilation and medication have been reported in different countries (2). It is being suggested that this can lead to the rationing of healthcare, forcing decisions on who can live and who can die (3). Healthcare workers are working in high-stress environments and longer hours to deal with the high demand for care. In addition, the safety of healthcare workers is put on the line by a shortage of personal protective equipment (PPE) (4). This has led healthcare professionals to have higher exposure to the virus, with many developing symptoms and having to self-isolate leading to a smaller workforce (2).

In the usual everyday setting of a hospital, medical students play a crucial role. For example, they assist in surgeries, perform check-ups, ward-based tasks, provide analytical assistance or contribute to research. However, in order to contain the spread of disease, non-urgent healthcare has been halted in several locations. In addition, with many medical curriculums and placements suspended, students are now found with more free time to help. Medical students have been trained and can provide specific skills that the general population cannot, and these skills can be utilized to help the declining workforce. In a setting where so much is demanded from the health care system, it is crucial to develop ideas on what the role of the medical student should be in this pandemic. In the past, medical students have been active during health emergencies in many different roles including medical assistance and logistical assistance (5).

This paper aims to investigate and provide an overview of different approaches that have been adopted worldwide towards the role of medical students during the initial stages of the COVID-19 pandemic. This information can provide insight, new ideas and work towards establishing safe, efficient and useful roles during the progression of this pandemic.

Methods

An online questionnaire was designed by the authors which included both open space questions where participants could input their opinion, and closed questions with predetermined options to choose. The questionnaire collected important demographic data from each student as well as the main questions which followed the same themes as the aims:

1. Current role of medical students in the pandemic
2. Whether the roles were paid
3. Status of medical education

The questionnaire was distributed online in a number of social media platforms, namely Facebook, WhatsApp, Instagram, Slack and LinkedIn, through personal and public group channels likely to be seen
by medical students worldwide. The questionnaire was open and receiving responses between the 16th and 20th of March 2020. All participants were asked to give their consent for research purposes when submitting the questionnaire.

The results were inputted into an excel sheet and responses were grouped by country. Data analysis was performed to calculate in which percentage of countries students played a role during the pandemic, whether these roles were paid roles or not, which percentage of students had their education suspended, and what the roles of medical students were across the globe. Qualitative thematic analysis was also performed on open space questions, to gain more insights regarding the roles of medical students across different countries. The answers were gathered and grouped by different types of possible roles: medical assistance, helplines, raising awareness, miscellaneous assistance, in progress, and no role.

Results

The questionnaire received a total of 144 responses. The responses were provided by 136 medical students, 1 dental student, 1 health sciences student, 1 management student, 1 medical intern, 1 pharmacist, 1 Ph.D. student, 1 professor, and 1 resident. The medical students were divided across different years, namely 5.8% in year one (n=8), 5.8% in year two (n=8), 12.5% in year three (n=17), 23.5% in year four (n=32), 25.7% in year five (n=35), 25.7% in year six (n=35), and 0.7% in year seven (n=1). In total, responses were reported from 47 countries representing all United Nations Regions. Respondents came from a total of 81 different universities.

The role of medical students was most reported as providing medical assistance, namely in 61.7% of countries (n=29), as portrayed in Graph 1 ‘The roles of medical students reported with the percentage of countries in which the role has been reported’ . This includes working in Emergency Departments specifically, screening and assessment clinics, assisting in GP practices and triaging. Some also described continuing clinical placements but perhaps focusing more on performing tasks to ease the workload of doctors. Some students also reported helping with testing and taking swabs for COVID-19. Some medical schools are fast-tracking graduation to allow final year students to start working as qualified doctors early. Graph 1 also shows that in 46.8% of countries (n=22), it was reported that students provided support in helplines. The eligibility to be involved in this varied; for some this was only senior medical students, in other places lower years were included after specific training.

In 42.6% of countries (n=20), it was reported that students had no role. It was reported that either there was no communication about an organized way for medical students to contribute, or that medical students had been prohibited from being involved in outbreak management or pandemic control efforts.

In lesser frequency, it was reported that students also supported in logistical assistance (34.0%, n=16), testing (19.1%, n=9), baby-sitting (14.9%, n=7), awareness (12.8%, n=6), triage (2.1%, n=1) and supporting a physician at home (2.1%, n=1). Concerning awareness, respondents highlighted the role medical students can play in raising awareness of public health guidance and challenging false news, misconceptions, or people ignoring the rules. Some also described medical student organizations’ role in
creating digital campaigns to promote facts. In addition, many respondents described student-led initiatives to offer childcare to families of healthcare workers.

For many students, while immediate opportunities to contribute may not be officially available, they were aware of efforts to mobilize them currently happening. For example, students in a number of countries reported being asked to sign up to a database to register their interest, so they could be called upon to help if needed. In some instances, students are actively involved in coordinating this with authorities.

A detailed overview of the responses on the role of medical students per university can be found in Table 1. In this table, it is described that in all countries where students have roles at multiple different universities, differences are being reported between universities.

In 7.5% (n=3) of the 40 countries where students are performing services, it is reported these are paid services. In 65.0% (n=26) of these countries, these services are not paid. In 15.0% (n=6) of these countries, it depends on the service or the location. Finally, in 12.5% (n=5) of these countries, it is unsure whether medical students will get paid for their services.

In 45.7% (n=37) of all universities, medical schools have been suspended with no reported (online) alternative for classes or exams.

**Discussion**

The results show that there is a varied amount of roles medical students play during the COVID-19 pandemic worldwide. In most cases, namely in 29 of the 47 countries that were reported on, medical students provide medical assistance. Other roles, in order of reports, included helplines, no role, logistical assistance, testing, baby-sitting, awareness, triage, and support of a physician at home. We can conclude that medical students are contributing to the management of a pandemic in numerous ways, which is a crucial insight during such times of high burden to health systems. Previous research supports this claim by showing that senior medical students are capable of supporting frontline care during a pandemic (6). Further exploring the impact this has had on healthcare systems can help guide which roles are most suited for medical students and most useful for the health workforce.

The results show that in 45.7% of medical schools, education has been completely suspended. This can lead to delays in graduation and time to start paid work. On the other hand, the results report that in 61.7% of countries, medical students are providing medical assistance. In other countries, different types of assistance are provided as well. However, it is unclear whether this assistance will provide credit scores toward the degree. The balance between continuing medical education as well as helping during the pandemic should be weighed up by medical school bodies, and any overlap that can help achieve both and support medical education during this time should be utilized.

Results show that only between 7.5–15% of countries, students are being paid for their roles. It only follows logically that if medical students are not receiving an education, but are contributing to the health
care system, financial compensation and adequate working conditions should be offered. However, this is clearly not the case at present. More research is needed to determine whether medical students have adequate working conditions and work according to a protocol and/or official statement.

Furthermore, there are differences in the roles of medical students between universities in the same countries. One potential explanation of this is that policies are evolving and national strategies might be developed in the future. It is important to be aware that these differences currently exist and reviewing the process between universities, institutions, and students in solidarity might be able to shed light on how to coordinate the process most efficiently.

In addition, there is no data on whether the initiatives were student-led or institution-led. It is important to gain clarity on who develops the roles of medical students and what factors are being taken into account in different countries. For example, past research has shown that medical students might not be properly trained in the use of PPE, which is an essential skill during this pandemic (7). Looking at the difference in safety, working conditions, role clarity and recruitment rates between official body and community-led initiatives, it would be important to assess the need for more official decisions and input on this topic.

Some limitations of our article include the lack of awareness on the capacity of those who filled in the questionnaire and their knowledge of current policy. The differences in reported roles within the same university might show that some are more aware of policies than others. Additionally, we were unable to collect data in impact to the medical system due to the situation being extremely novel. However, due to the paucity of literature on this topic, this article provides unique information on a worldwide scale of both institutional and governmental decisions.

It is clear that the roles of medical students during this pandemic is constantly developing and changing during this uncertain and fast-paced period. We believe that this preliminary data can help guide institutions to further develop these recommendations. Further research into how these roles will change during the pandemic as well as the impact they have on health systems will help create a clear picture of the role of medical students during COVID-19 as well as future pandemics.

Conclusions

Our results show that medical students have the capability to contribute in many different ways during this pandemic. In most cases, roles are unpaid and many reports show that there is no clarity on whether their roles will count towards their educational credits. It is crucial to develop adequate protocols and statements, so medical students can contribute to the best of their capacity and in a safe, ethical and healthy manner during the pandemic, for which additional research and collaboration between institutions is needed.

Abbreviations

WHO
Declarations

Ethics approval and consent to participate

The ethics approval is waived. Consent to participate was actively gathered and received from every single participant of the questionnaire.

Availability of Data and Materials

The full dataset supporting the conclusions of this article is included within the article's additional files. The dataset used and/or analysed during the current study is available from the corresponding author on reasonable request.

Competing Interest Statement

All authors have completed the ICMJE uniform disclosure form at http://www.icmje.org/coi_disclosure.pdf and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

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Authors contributions

IMB designed the study supported by GW and IV. IMB curated the data supported by GW and IV. IMB, GW, IV and AM formalized and analyzed the data. IMB, GW, IV and AM wrote the manuscript.
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Not applicable.

Author's Information

IMB, IV and AM are current medical students and GW is a recent medical graduate. All four authors have an interest in global health.

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Table

Table 1 Detailed description of roles of medical students per university in different countries
| Country                | n (%) | University (n)                                      | Reported Roles of Medical Students (n, if reported more than once)               |
|-----------------------|-------|----------------------------------------------------|---------------------------------------------------------------------------------|
| Albania               | 8 (5.6) | The University of Medicine, Tirana (8)            | Medical assistance (5), logistical assistance (2), helplines (2), none           |
| Algeria               | 1 (0.7) | University of Constantine (1)                     | None                                                                            |
| Australia             | 6 (4.2) | University of Melbourne (3)                        | None (2), medical assistance                                                    |
|                       |        | University of Newcastle (1)                       | None                                                                            |
|                       |        | University of New South Wales (1)                 | None                                                                            |
|                       |        | University of Western Australia (1)               | None                                                                            |
| Austria               | 1 (0.7) | University of Heidelberg (1)                      | Medical assistance, helplines                                                  |
| Bosnia and Herzegovina| 1 (0.7) | University of Sarajevo (1)                        | None                                                                            |
| Brazil                | 1 (0.7) | Federal University of Santa Catarina (1)          | None                                                                            |
| Cameroon              | 1 (0.7) | University of Buea (1)                            | Awareness                                                                      |
| Canada                | 1 (0.7) | University of Calgary (1)                         | Medical assistance, logistical assistance, baby-sitting, testing, helplines     |
| Colombia              | 1 (0.7) | Uninorte (1)                                      | Medical assistance, helplines                                                  |
| Costa Rica            | 1 (0.7) | University of Costa Rica (1)                      | Medical assistance                                                            |
| Croatia               | 1 (0.7) | University of Zagreb (1)                          | None                                                                            |
| Cyprus                | 2 (1.4) | Near East University (1)                          | None                                                                            |
|                       |        | University of Cyprus (1)                          | Medical assistance                                                            |
| Czech Republic        | 1 (0.7) | Msaryk University (1)                             | Medical assistance, logistical assistance, testing, helplines                   |
| Egypt                 | 4 (2.8) | Alexandria University (2)                         | Awareness (2)                                                                  |
|                       |        | Ain Shams University (1)                          | Testing                                                                        |
| Ethiopia              | 1 (0.7) | Addis Ababa University (1)                        | Helplines                                                                      |
| France                | 2 (1.4) | University of Caen (1)                            | Logistical assistance, helplines                                               |
|                       |        | University of Montpellier (1)                     | Medical assistance, logistical assistance, helplines                           |
| Germany               | 2 (1.4) | Humboldt University (1)                           | Testing, helplines                                                             |
|                       |        | University of Giessen (1)                         | Medical assistance, logistical assistance                                       |
| Greece                | 1 (0.7) | Aristotle University of Thessaloniki (1)          | None                                                                            |
| Guatemala             | 1 (0.7) | University of San Carlos of Guatemala (1)         | Medical assistance, helplines                                                  |
| Honduras              | 1 (0.7) | National Autonomous University of Honduras (1)     | Medical assistance                                                            |
| Hungary               | 2 (1.4) | Unknown (2)                                       | Medical assistance (2), helplines                                              |
| Italy                 | 2 (1.4) | University of Florence (1)                        | None                                                                            |
|                       |        | University of Naples Federico II                  | None                                                                            |
| Country                  | Count (Score) | University/Institute                                      | Services                                                                 |
|-------------------------|---------------|----------------------------------------------------------|-------------------------------------------------------------------------|
| Jamaica                 | 1 (0.7)       | University of the West Indies (1)                        | Awareness                                                               |
| Kazakhstan              | 1 (0.7)       | Karaganda Medical University (1)                         | Medical assistance                                                     |
| Latvia                  | 1 (0.7)       | Riga Stradins University                                  | Medical assistance, testing                                            |
| Malaysia                | 9 (6.3)       | University of Malaya (5)                                 | None (5)                                                                |
|                         |               | AIMST University (1)                                     | None                                                                    |
|                         |               | Monash University (1)                                    | None                                                                    |
|                         |               | UCSI University (1)                                      | Helplines                                                              |
| Mexico                  | 2 (1.4)       | Autonomous University of Chihuahua (1)                   | Medical assistance, helplines                                           |
|                         |               | Autonomous University of Queretaro (1)                  | Medical assistance                                                     |
| Morocco                 | 1 (0.7)       | University of Hasan II Casablanca (1)                    | Medical assistance, logistical assistance, helplines                   |
| Nepal                   | 4 (2.8)       | Tribhuvan University (4)                                | Helplines (3), logistical assistance (2), medical assistance           |
| The Netherlands         | 12 (8.3)      | University of Amsterdam (6)                              | Helplines (4), baby-sitting (3), medical assistance (3), testing (2), triage |
|                         |               | Free University of Amsterdam (2)                         | None (2)                                                                |
|                         |               | Leiden University (2)                                    | Baby-sitting (2), logistical assistance, helplines                     |
|                         |               | Erasmus University Rotterdam (1)                         | Medical assistance, logistical assistance, helplines                   |
|                         |               | Groningen University (1)                                 | None                                                                    |
| Nigeria                 | 3 (2.1)       | Federal University of Technology (1)                    | None                                                                    |
|                         |               | University of Ibadan (1)                                 | None                                                                    |
|                         |               | Unknown (1)                                              | None                                                                    |
| Norway                  | 1 (0.7)       | Norwegian University of Science and Technology (1)      | Medical assistance, testing, helplines                                 |
| Palestine               | 1 (0.7)       | Al-Quds University                                       | Awareness                                                               |
| Portugal                | 9 (6.3)       | NOVA University (7)                                      | None (5), helplines (2)                                                |
|                         |               | University of Coimbra (2)                                | None (2)                                                                |
| Romania                 | 1 (0.7)       | UMF University of Medicine and Pharmacy (1)              | Logistical assistance (2)                                              |
| Russian Federation      | 2 (1.4)       | Saint Petersburg State Pediatric Medical University (1) | Medical assistance                                                     |
|                         |               | Samara State Medical University (1)                     | None                                                                    |
| Rwanda                  | 1 (0.7)       | University of Rwanda (1)                                 | Medical assistance, awareness                                           |
| Slovenia                | 1 (0.7)       | University of Ljubljana (1)                              | Helplines                                                              |
| Spain                   | 8 (5.6)       | University Alfonso X the Wise (5)                        | None (5)                                                                |
|                         |               | Autonomous University of Barcelona (1)                  | Logistical assistance, baby-sitting                                    |
|                         |               | University in Lleida (1)                                 | Medical assistance, logistical assistance, baby-sitting,               |
| Country       | Number (Population) | University Name                                      | Services                                                                 |
|--------------|---------------------|-------------------------------------------------------|--------------------------------------------------------------------------|
| Sudan        | 6 (4.2)             | Omdurman Islamic University (2)                      | Awareness, none                                                          |
|              |                     | Ahfad University for Women (1)                       | Medical assistance, logistical assistance, testing                       |
|              |                     | Al-Zaied Al-Azhari University (1)                    | None                                                                     |
|              |                     | Unknown (2)                                           | None                                                                     |
| Switzerland  | 15 (10.4)           | University of Basel (13)                             | Medical assistance (12), helplines (8), logistical assistance (7), baby-sitting (6), testing (6), none |
|              |                     | University of Lausanne (2)                           | Medical assistance (2), helplines                                        |
| Togo         | 1 (0.7)             | University of Lomé                                   | Logistical assistance                                                    |
| Tunisia      | 1 (0.7)             | University of Monastir                                | Logistical assistance, helplines                                         |
| Turkey       | 10 (7.0)            | Ankara Yildirim Beyazit University (2)               | None                                                                     |
|              |                     | Baskent University (2)                               | None                                                                     |
|              |                     | Istanbul University (2)                              | Medical assistance (2)                                                   |
|              |                     | Ankara University (1)                                | None                                                                     |
|              |                     | Bahcesehir University (1)                            | Logistical assistance, baby-sitting, helplines                           |
|              |                     | Ege University (1)                                   | Medical assistance                                                       |
|              |                     | Yeditepe University (1)                              | None                                                                     |
| Ukraine      | 1 (0.7)             | Unknown (1)                                           | Medical assistance                                                       |
| United       | 8 (5.6)             | King’s College London (4)                            | Baby-sitting (4)                                                         |
| Kingdom      |                     | Queen Mary University of London (1)                  | None                                                                     |
|              |                     | University College London (1)                        | Logistical assistance, helplines                                         |
|              |                     | University of East Anglia (1)                        | Medical assistance, logistical assistance, baby-sitting                 |
|              |                     | University of Nottingham (1)                         | Baby-sitting                                                             |
| United States of America | 2 (1.4) | Temple University (1)                               | None                                                                     |
|              |                     | University of Minnesota (1)                          | Baby-sitting, support physician at home                                  |

**Supplementary Files**

This is a list of supplementary files associated with this preprint. Click to download.

- Graph1.docx
- Dataset.docx