

Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



REVIEW

Available online at **ScienceDirect**

www.sciencedirect.com

Elsevier Masson France EM consulte www.em-consulte.com/en



COVID-19: Public health issues and ethical dilemmas



C. Kooli (Phd) (Visiting Researcher)

Lusail University, Doha, Qatar

Received 1st November 2020; accepted 25 January 2021 Available online 31 January 2021

KEYWORDS

COVID-19; Ethics; Healthcare sectors; Public health; Public policies Summary There are various ethical dilemmas faced by the healthcare sectors, especially at times of pandemics and health emergencies, which is more prominently visible in the case of public healthcare sectors. Keeping this into consideration, the concerned study had emphasized exploring the ethical dilemmas that are faced by the public health care sectors across the globe, in fighting the COVID-19 pandemic situations in the current period. The secondary and qualitative information collected for the concerned study has been analyzed and interpreted using the thematic analytical framework and following the inductive approach. Substantial evidence has revealed that the public health care system globally has been facing a scarcity of resources and allocation of responsibilities to the care provider. There has been disparity noted in the implementation of public health care ethics. The importance of ethics in the public healthcare system cannot be denied however, the issues noted during this pandemic situation have been associated with lack of accountability, issues in resource allocation, and loss of trustworthiness in the healthcare provisions. Hence, there is a need for changes to be made in the public policies and health policies so that the public health institutions are more prepared to deal with emergencies such as the one created by the COVID-19 pandemic. © 2021 Elsevier Masson SAS. All rights reserved.

Introduction

The public health care sector in any country across the globe is considered as one of the most crucial pillars ensuring the health, safety, and welfare of the entire population of the concerned country. The robustness of the health care sector and especially the public health care system in a country highlights the abilities of the country to handle health-related emergencies and anticipated as well as unanticipated challenges. Ethics is one of the immensely vital components of health and medical care in general, and in

https://doi.org/10.1016/j.jemep.2021.100635 2352-5525/© 2021 Elsevier Masson SAS. All rights reserved.

E-mail address: ibm4chk@yahoo.fr

the public healthcare sector in special [1]. Bommier [2] defines ethics as ''the art of assuming responsibility for others, for humanity, for the Earth, and of self-questioning". He also considers that ''ethics tells us is that, through the diversity of opinions, we must respect the values of others while defending our own and put the question of meaning at the forefront'' Bommier [3]. From their side, Hervé et al. [4] admitted that ''ethics is a permanent, necessary, useful, vital object". For them, civilization and ethics are associated each other's and are the symbols of the progress and humanization [4]. Nowadays, public health ethics is a widely recognized subfield of ethics. Moreover, Radoilska [5] considers public health ethics as a distinguished discipline. Levy [6] admits that the existence of such subfield or discipline reflects the conviction that healthcare is mainly a moral issue. This is primarily because; medical ethics helps to maintain the dignity, integrity as well as welfare of the patients and care-seekers by holding the care providers accountable for their actions.

Thus, Munthe [7] considers professionals, policies and regulations as the main controllers of the public health. These regulation agents convey ideas about the principles and beliefs that public health can uphold, and these values drive what is considered as a tenable and appropriate practice in public health [7]. The ethical considerations progressed in line with the evolution of the perception of the public health. Verweij and Dawson [8] admitted that the promotion of population health was considered as the traditional goal of public health. Under this perspective of practice of health care, ethical considerations focused on the person cared for [7]. However, the aim of the field of public health was redefined to integrate firstly the new concept of the promotion of equality and reducing inequalities [9]. Ethically speaking, this developed approach aims to empower different communities that are powerless or vulnerable. Unfortunately, the later development of the public health concept limited the personal autonomy of the individuals. Thus, the goal of the public health was again further extended during the 80th and 90th. It actually considers providing health opportunities and information about public heath, and respecting people's choices with respect to the use of these opportunities. In reality, it considers offering health opportunities and public health information and respecting the choices of people in terms of using these possibilities [7]. The two latest developments of the goals of public health at their turn generated a migration of the aim of the ethical considerations. In fact, the modern public health ethics approach focuses more on populations rather than on individuals. Despite the evolution of the concept, the design of the ethics of public health in its individual and collective approach loses its fundamentals in the case of health emergencies. In such context, the concepts of equality and personal autonomy lose their importance and the perception of ethics become completely different than in normal situations [10]. Thus, Smith and Upshur [11] presented a new definition of infectious disease/pandemic ethics that is based on centrality of solidarity and focuses on value-conflicts. It also defines what is morally right and wrong in such circumstances. From his side, Pierce [12] admitted that in response to certain public health challenges, public health policy shall modify the responsibilities, roles and rights of people.

The world, in the present period, can be seen to be fighting health emergencies through the constant and rapid spread of the coronavirus. The COVID-19 crisis has already taken a shape of a pandemic in the present period, due to the lack of availability of vaccinations for the diseases until now. There have been more than 34.2 million cases across the globe and the virus has already claimed the lives of more than 1.02 million people globally [13].

This has led to an unprecedented rise in the demand for healthcare and emergency services and also a huge influx of patients in the ICUs of hospitals, with differences in the level of critical conditions. This has led to overburdening of the public health care systems as well as health care workers and front-liners, who are also constantly at high risk of contracting the virus, thereby risking themselves and their family members. The excess demand for care is also leading to the need for the development of triage policies in prioritizing patients as per their needs and conditions. All these are leading to the development of considerable ethical dilemma in the public healthcare sectors across the globe, in the current COVID-19 pandemic situations [14].

The pandemic situation due to the spread of the COVID-19 crises has been constantly putting the public healthcare systems of every country to test and apart from the challenges of the provision of effective care and safety to the increasingly infected population across countries; these sectors are also facing various ethical issues. The issues of the ethical dilemma are being faced not only in the domain of development of triage, regarding provision and withdrawal of ICUs and life-supports and also regarding family visits and quality of care provided. Ethical dilemmas in providing services at the risks of the welfare of the care providers and their families are also being faced by the public healthcare sectors in general. The concerned study intends to explore, identify, and discuss these ethical dilemmas.

The primary aim of the study is that of exploring the ethical dilemmas that are being faced by the public healthcare sectors in all parts of the globe, due to the spread of the COVID-19 pandemic situations. The study focusses on the threats to the medical ethics which are emerging in the present period, especially emphasizing the types of dilemma that are being faced by the caregivers, not only regarding the health and safety of the patients but also regarding making decisions about the trade-off between their safety and patient's welfare. The potential steps and solutions for solving these dilemmas have also been discussed in this study.

The objectives addressed by the concerned study consist of:

- assessing the types of crisis that are faced by the public healthcare sectors in the current COVID-19 crises;
- identifying and discussing the ethical dilemmas arising in public healthcare sectors due to the spread of the COVID-19 pandemic;
- discuss the reasons behind the development of ethical dilemmas;
- finding potential solutions for the ethical dilemmas.

The main research question consists of exploring the different ethical dilemmas that are associated with COVID-19 in the public health sector.

Research methodology

The aim of the concerned study being that of observation and discussion of the ethical dilemma in the public health sector in the current COVID-19 situations and for this study, Interpretivism Philosophy has been incorporated. Interpretivism helps in those studies, which concentrate on mainly social phenomena and try to discuss and describe their outcomes based on different information sources and types. According to Zangirolami-Raimundo et al. [15] explanatory design helps in conducting investigations in those domains where there is no presence of previous studies, and in general, structured and quantitative studies are facilitated by this design. The Descriptive Design has been adopted for the concerned study, taking into consideration its primary objective of assessing the ethical dilemma arising in public health sectors in the times of the pandemic. The descriptive design helps in those researches where phenomena or situations are required to be described based on existing information in the concerned domains, and this design helps in the incorporation of both numerical as well as ordinal data [15].

The concerned study has not formed any kind of presumption regarding the ethical dilemma in the domain of public health care sectors in the times of COVID-19 [16]. It has adopted the Inductive Approach, to collect the relevant information regarding the concerned dilemma and has then tried to interpret the same, thereby drawing new inferences. According to Basias and Pollalis [16], the inductive approach in a study facilitates information collection and analysis in the first stages of the study and based on the interpretation of the same, inferences and outcomes are drawn and discussed. The concerned study has tried to discuss in-depth the ethical dilemmas cropping up in the public health care sectors due to the ongoing crisis of the COVID-19 pandemic situations. To explain these aspects, the study needed extensive and in-depth, and subjective information, and keeping this into account, the concerned study has relied on *Qualitative Information*. The secondary and qualitative information collected for the concerned study, has been analyzed and interpreted using the Thematic Analytical framework. The themes have been constructed in the study, keeping into consideration the study objectives and the questions that the study has intended to address.

Data collection and analysis

Theme 1: study of unethical behaviour adopted by medical practitioners during the pandemic

The lab scientists at the University of Kentucky HealthCare had found false-positive test results of COVID-19 after they reviewed the data from the testing platform, Thermo Fisher according to a local affiliate of NBC, 110 News. After the review of the test reports, 26 tests between July 16 and July 27 were found to be false although it had received FDA's emergency authorization. The 26 samples were then retested by using another platform to receive negative

 Table 1
 Key unethical behaviours adopted by medical practitioners.

| practitioners. | | | |
|--|--|---|--|
| Staff/organization concerned | Issue | Ethical considerations | |
| Medical lab technicians and physicians | Falsification of COVID-19 test results (positive or negative) Lure of gain | Impact on the population public health Well-being of the population Economic impact through loose of days of work Spread of diseases | |
| Physicians and nurses | Refusal of trials Scarcity of resources and fear | Refusal of diagnosis and triage Non assistance of persons in danger Non adherence to the profession deontology | |
| Source: personal work. | | | |

results and it was noted that the glitch in the test results could be attributed to a flaw in the software [17]. The software defect has been detected yet it was found that on the platform, 30,000 COVID-19 tests had been conducted on the laboratory of the health system and there might have been other cases of such glitch in the software used. In the described case, a non-voluntary technical issue led to false COVID-19 results. However, in some African countries like Tunisia, some private laboratories, attracted by the lure of gain, falsified COVID-19 tests [18]. In fact, they provided to some of their clients with positive results to encourage them to have their families and professional and other relatives tested. In addition, in UAE, the Abu Dhabi Emergency, Crisis and Diaster Prosecution admitted that two employees at a COVID-19 testing facility have been arrested for falsifying COVID-19 test results. The medical practitioners had previously collected images of COVID-19 negative samples from other uninfected individuals in the database and used them to falsify records in exchange for money [19]. In the UK, there are also cases noted when doctors in private clinics have refused to treat patients without even testing them for COVID-19 infection in the fear of exposure. In the UK, the General Medical Council (GMC) had recommended doctors to refrain from such practices. The Table 1 summarizes the key unethical behaviours adopted by medical practitioners.

Theme 2: the public health system and the adherence to ethical values

Another ethical issue was also observed in the clinical care of the 'non-COVID' patients in the UK the hospitals. There has been a suspension of the emergency services that have restricted its availability for the non-COVID patients and due to isolation and lockdown, the number of deaths has increased. There has been an assessment of the data sets of the number of tests conducted in the healthcare setting (pillar 1) and tests done in the community in the UK (pillar 2). Looking at the July data, if data is assessed based on the date on which the specimen is taken then the case number varies when assessed with the reported test date [20]. Also, on July 28, there were 64 cases reported in pillar 1 and 512 cases in pillar 2 but the government site had reported fewer cases combined. This shows the inaccuracy in the reporting of the cases. Data inaccuracy and poor interpretation had mainly been noted in pillar 2, as the community setting is not clear.

COVID-19 has caused the deferral of millions of elective procedures and created unprecedented surgical backlog [21]. The postponement of millions of elective procedures may have a potentially fatal effect on patients [22]. There was worry noted among the surgeons that whilst the resources from the healthcare is directed against the pandemic, the double effect might predict the efforts of public health shall cause maleficent effects through the delays in the surgical treatment of hospitals. Other than fear, the delays of surgeons are in part linked to the changes that affected the health care systems through the COVID-19 crises. Many medical offices have remained closed during the pandemic. Others faced availability for workers, enhanced sanitation protocols and reserved hospital capacity protocols. In fact, these changes stopped many patients from being cared for. In addition, due to the reduction in personnel and hospital equipment, emergency surgery during COVID becomes difficult to conduct [23]. In fact, COVID-19 cases spiking oriented resources through combating the spread of the disease and consequently the postponement of the elective surgeries. Ethically speaking, the deferral of millions of elective surgeries could create several ethical dilemmas. In fact, there is no guarantee that the shortterm fixes do not cause long-term harms for patients. Also, the reality shows that the waiting times for surgeries are bound to get worse and worst and possibly affect more the patients. Today's unethical choices and decisions will add to the backlog and the waiting lists. We could immediately save lives of COVID-19 patients, however in the long run we will affect lives and well-being's of millions of persons waiting future surgeries. Most importantly, the possible damage caused by a retarded surgery due to a deteriorating condition must be balanced from the potential harm caused by a high risk of patient and resource use. Those that took the decision of delaying surgeries did not care about the associated emotional challenges that could in certain cases be more fatal than the illness itself. The Table 2 summarizes the key unethical behaviours adopted by medical institutions.

Theme 3: business ethics during pandemics

The ethical consideration during the pandemic is not just economic but also is lying at the care of the business today. Business ethics is very crucial for behaving ethically and to gain and maintain trust among the key stakeholders engaged. In the healthcare setting, the business ethics during the pandemic situation can be observed as building
 Table 2
 Key unethical behaviours adopted by medical institutions.

| institutions. | | | |
|---|--|--|--|
| Staff/ organization concerned | Issue | Ethical considerations | |
| Government, medical clinics and hospitals | Refusal of trials Scarcity of resources and fear Suspension of the emergency services Inaccurate and misleading information regarding the spread of the disease Delaying surgeries | The availability of scarce resources Exposure of the life of medical practitioners to dangers Exposure of the life of patients to dangers Decline of health literacy Harm the public Accelerate spared of diseases Fatal effect on patients | |
| Source: personal work. | | | |

a new business ecology where the business model in the healthcare setting is not just guided by profit generation but also by maintaining business integrity and respect for human values such as beneficence, justice, and honesty in the patient-hospital or patient-clinic interaction. Business ethics during the pandemic also means there is a need for adjusting the aspects of corporate social responsibility with the key aspects of the treatment of patients in the hospital. Business ethics is required for maintaining transparency in the availability of the required resources that would be necessary for tackling the pandemic situation such as the protection kits, medical facilities, and others. In US' longterm care facilities there had been deaths due to lack of additional options for boarding, PPE availability and similar issues had been noted in a psychiatric hospital in South Korea when 101 of the 103 patients had contracted virus due to a shortage of PPE supply [24]. There are also examples of a nurse that took her life because she was unable to cope with the irreconcilable moral distress and stress due to the pandemic. In Tunisia, there was a piece of news reported whereby a local medical laboratory had falsified the COVID-19 results of the patients to push the medical exams for paying more for the bills. In the same country, due to the shortage of test kits for COVID-19 tests, private laboratories and medical clinics have doubled the price of the tests. In the United States of America, consumers have been warned against COVID-19 quackery and price gouging [25]. The Food and Drug Administration and the Federal Trade Commission warned seven firms because they have been caught marketing soaps, sprays and other concoctions with misleading claims that they can cure or prevent people from catching the latest coronavirus. In addition, le Mauricien [26] newspaper mentioned that hundreds of Mauritius firms

profited from the pandemic crises and public health emergency to practice price gouging. Indeed, various consumer products like soaps, sprays are currently sold at double or even triple prices by certain merchants in several regions of the island.

Theme 4: progressive regulations are undertaken for protecting medical practitioners and citizens

During COVID-19, several countries adopted progressive regulations in order to protect their healthcare systems and practitioners against potential emergent unethical behaviours. The UAE government has declared a fine of up to 20,000 dirhams against anyone found guilty of peddling fake news about the pandemic and it was also declared that only the state health institutions and health ministry could distribute guidelines and truthful health information in UAE [27]. Abu Dhabi in UAE has also tightened the requirements for COVID-19 testing after two men were arrested for the fabrication of the COVID-19 death report and many others had been detained by the Abu Dhabi Police spreading fake news [28]. Moreover, Abu Dhabi had also banned the use of the rapid test for detecting antibodies in the blood for reporting COVID-19 after studies had confirmed the inaccuracy of the test and giving false-positive results. The test was noted to have a 30% accuracy rate and hence had been banned by the Dubai Health Authority (DHA) by generating circular in hospitals, pharmacies, and outpatient clinics [29]. Coronavirus Act 2020 passed by the UK Government has provisions for the emergency registration of the health professionals and Temporary registration of the social workers. It also lays down provisions for the recruitment of emergency volunteers and the terms of their compensation. The act has made a temporary modification in the mental capacity and mental health legislation and also provides for indemnity of the health service activities in England and Wales. The act had been launched for addressing the issues being faced by UK authorities by giving them emergency powers for the next six months. The attempt is to understand the scarcity of resources that includes physical and human resources and redistribute the resources for attending COVID-19 cases.

Discussion

Based on the understanding of the data collected from sources and the literature review conducted, the researcher realized that the COVID-19 pandemic situation has raised the ethical dilemma of public health.

The four discussed themes led us to observe two main types of unethical behaviours. The first one is by constraint and the second one by choice. As example, the emergency created by the pandemic, the actual medical system and the scarcity of resources pushed medical practitioners to take unethical decisions by constraint. In the first theme of the research, we observed that the scarcity of resources pushed medical practitioners to make choices or even take wrong decisions that participated in aggrading the negative outcomes of the pandemics. In addition, as observed in second theme, the decisions taken by the healthcare system like the suspension of the emergencies and elective surgical treatments generated an increase in the number of deaths. Also, the demand for life support and ventilation has increased and there is an ethical dilemma being faced by the doctors in the hospitals about retaining life support for critical patients. The ethical issues during the pandemic situation have been related to the jeopardization of the autonomy of the patients and the decision-making of the use of hospital and clinic resources. Verweij et al. (2020) [30] admitted that in a case of utter scarcity, pandemic victims should have no preference over normal patients. Consequently, actions that go against this approach are considered as unethical practices. In the other side, WHO [10] and several other researchers [6,7,31] suggested the design of public health policies that could ethically guide medical practitioners in pandemic situations.

Substantial evidence has revealed that the public health care system globally has been facing a scarcity of resources and allocation of responsibilities to the care provider. There has been disparity noted in the implementation of public health care ethics. The importance of ethics in the public healthcare system cannot be denied however, the issues noted during this pandemic situation have been associated with lack of accountability, issues in resource allocation, and loss of trustworthiness in the healthcare provisions. The scarcity of public health resources and service has led to the ethical dilemma of the care providers regarding the prioritization of patients, based on their conditions and needs for healthcare. A recent research conducted by Verweij et al. [30] (2020) suggests that in pandemics, ethical expertise has no place in triage decision-making as long as medical standards may still play a role in selecting patients. However, other research [10,32,33] admitted that in pandemic situations, medical practitioners act in special circumstances and have no control over the situation. Thus, their responsibility became "relative" and their actions are strictly causal and invoke moral evaluation. Under this perspective, the choices made by medical practitioners could be qualified as unethical. It is simply the necessity of the situation that led them to act accordingly. Then, we could admit that what is considered as unethical during normal situations could become an ethical practice during pandemics.

The effects of the coronavirus have disturbed the tradeoff between the proper treatment of the patients and the availability of services and that has raised ethical issues in the public healthcare system. Considering that the virus is contagious there is an ethical dilemma being faced by the healthcare workers who are concerned about their life threats in addressing the patients' needs. Furthermore, this affects the overall welfare of the patients if healthcare workers refuse to attend to the patients if they are concerned about their life. Many healthcare institutions, either due to efforts of containing the virus in the hospital or clinic or due to scarcity of resources are refusing admission to patients that show the unethical conduct of the healthcare system. It has been noted that many patients in the hospital in Northern Italy had been dead due to the negligence of the nurses and the refusal of the doctor to attend to the patients in time.

In such circumstances, Levy [6] admitted that the question of responsibility through contexts and capacities became very important and difficult to answer. From his

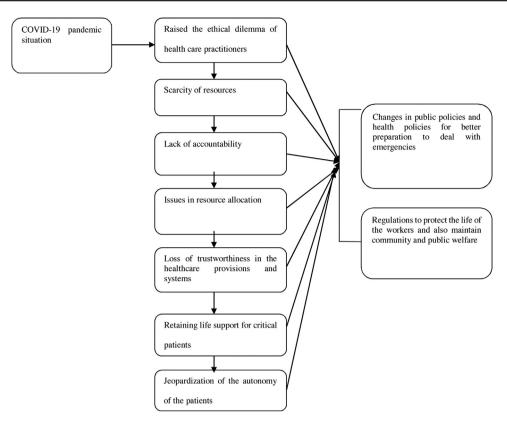


Figure 1. How to deal with COVID-19: ethical dilemmas in public health sector.

side, [34] Selgelid (2008) raised the question of duty to treat. For him, even once pandemics situations risk to health workers themselves, it is widely accepted that health workers have a responsibility to provide for patients. Also, with different degrees of intensity, guidelines for professional ethics insisted on the importance of providing services during pandemics [35]. Thus, we conclude that the observed negative behaviours adopted by some medical practitioners during COVID-19 could be assimilated as unethical behaviours.

Considering that the medical practitioners have a significant role to play in the decision making for the treatment of the patients in a challenging situation, the medical practitioners would require upholding fundamental principles of medical ethics such as nonmaleficence, justice, autonomy, and beneficence. Thus, teaching medical ethics and scientific honesty need to be taught officially in medical programs [36]. Employers are also encouraged to offer trainings [37] about ethics and ethical behaviours in regular and emergency situations.

Refusing to assist patients during pandemics should be regulated through policies and regulations. Emergency and non-emergency situations would require different underlying ethical frameworks [12]. Governments need to adopt policies specifying the effective and ethical use of scarce resources by ensuring that they are accountable to individuals and organizations responsible for results. Also, as suggested by Pierce [12] governments need to use the law's communicative ability to boost short- and long-term success in achieving public health objectives. Judicial rules may provide another promising way to make ethical concerns more relevant in the context of pandemics. The application of the principles of accountability, responsibility and the law enforcement to medical practitioners need also to be followed by the maintaining of safe workplace. Thus, governments and employers need to make certain that those who help patients during pandemics have the necessary protective equipment. We need also to guarantee the optimal conditions for maintaining a safe working environment.

It has further been noted that in such contexts, following medical ethics can help make the best choices for the patients given the scarcity of resources. The need for maintaining and respecting ethical values for the medical practitioners is arising from the increasing cases of false test reports being declared by medical laboratory and local community healthcare setting. There is a need for good judgments to be practiced by the medical practitioners to strive for the best treatment for the patients even in the scarcity of resources. Zero tolerance and law enforcement need to be observed in case of intentional modification of medical results.

Through constraint or by choice, medical practitioners have made ethical and unethical decisions. Thus, COVID-19 pandemic situation gave us the opportunity to reopen the debate and discuss the new emerging and challenging ethical dilemmas. Themes 1 and 3 revelled a second type of unethical behaviours observed by medical practitioners and medical institutions. This second type is more conscious and could be qualified as made by choice. Like war criminals, several medical institutions took benefit from the situation and tried to make more profit. We observed unacceptable practices of falsifying medical results in order to make more profit. We also observed monopoly actions of medical products and even prices inflation of certain medical acts. All these unethical behaviours negatively affect citizens socially, economically and psychologically. The falsification of cases that were tested positive to COVID-19 constitute also a threat to safety of citizens and medical practitioners. All these irresponsible acts and unethical behaviours shall be severely punished.

Hence, there is a need for changes to be made in the public policies and health policies as observed in theme 4 (Fig. 1). So, the public health institutions need to be more prepared to deal with emergencies such as the one created by the COVID-19 pandemic. Considering the situation in which the medical practitioners and Healthcare workers are conducting their duties, there is a need for regulations to protect the life of the workers and also maintain community and public welfare. WHO [10] anticipated such ethical dilemmas and drafted guidelines regarding ethical considerations for better pandemic preparedness. Scientists now expect that a pandemic situation happens every decade, thus local, national and global health authorities need to be ethically prepared to confront such extra circumstances.

Conclusions and recommendations

The findings of the concerned study highlight the presence of considerable ethical dilemmas that are being faced in the public health sector in the present period, especially with the rising spread of the COVID-19 pandemic situations across the globe. The different ethical dilemmas were classified into unethical behaviours by constraint and unethical behaviours by choice. The study highlights the importance of promoting ethical values and ethical awareness in the domain of public health services, thereby highlighting the problems cropping up in maintaining these ethics in the current period, with the demand for public healthcare services soaring and also with the challenges of taking decisions regarding the most optimal allocation of the scarce public healthcare resources. The findings of the study highlight the presence of ethical dilemma in the domain of suspension of non-emergency services, deprivation of a section of people due to prioritization of scarce resources, the problems in reducing the burden of deaths occurring due to lockdown and isolation as well as the ethical issues arising in the domain of decisions and trade-offs faced by the public health sector workers. Through this research, we can issues two types of Recommendations. The first ones aim to improve health policies and public policies. The second ones are linked to regulations and laws for protecting medical practitioners and citizens.

It shall be recommended that the policies in the healthcare institutions need to be revised to increase the supply of necessary resources and other equipment taking into account the demand for treating the patients during COVID-19. The healthcare policies also need to be revised to include an arrangement of higher numbers of healthcare workers, both permanent and temporary to address the care demands. Public policies are also required to be redefined by enhancing the infrastructural support to communities that are worst affected by the pandemic so that it does not create pressure on the health care system.

For the protection of the medical practitioners, doctors, and nurses, healthcare workers in public and private health care institutions, there is a need for regulations to discharge more funds for the supply of protection kits and safety units for the private and public health institutions. New regulations need to be formulated for extending health benefits to the doctors and giving them exemptions so that they can provide care without hesitation. For the protection of the citizens, regulations need to be stricter for the proper testing system. To ensure that there is no unethical practice such as falsified positive cases for increasing medical bills, only authorized agencies and institutions need to be given the license and authority to conduct the test in larger amounts. For that, funds and supply of equipment needed to be regulated through appropriate legislations. Governments need also to issue regulations that protect consumers' right against the traders' abuse. Thus, policy makers need to issue regulation that consider those who practice quackery and price gouging during pandemics as war criminals. Finally, through the COVID-19 pandemic situation, we need to reopen the debate and discuss the new emerging and challenging ethical dilemmas linked to the healthcare sector. We need to understand more what comes first. Protecting lives of healthcare workers or the life of patients? Is it worth to observe ethical standards, take the risk and expose medical workers lives to danger? Is it justified to expose the life of medical practitioners and their family members to threats and save the lives of citizens? What are the ethical standards and values to observe at the time of prioritizing trials and delaying or stopping other medical services?

Funding

No funding.

Disclosure of interest

The author declares that he has no competing interest.

References

- [1] Berlinger N, Wynia M, Powell T, Hester D, Milliken A, Fabi R, et al. Ethical framework for health care institutions responding to novel Coronavirus SARS-CoV-2 (COVID-19) guidelines for institutional ethics services responding to COVID-19. The Hastings Center 2020;2:33–4 [http://scha-files.s3. amazonaws.com/Documents/HastingsCenterCovidFramework 2020.pdf (Accessed 2020, October 2)].
- [2] Bommier C. L'éthique de la conviction confrontée à la technologie. Ethics Med Public Health 2019;9:40–4.

- [3] Bommier C. L'histoire du corps : un éclairage pour le droit, l'éthique et la morale en médecine. Ethics Med Public Health 2019;8:65–73.
- [4] Hervé C, Wajman A, Bommier C, Tudrej B, Torres P, Charlier P. L'engagement éthique dans l'entreprise, comme dans toute institution doit être construit dès aujourd'hui pour demain. Ethics Med Public Health 2018;7:107–11, http://dx.doi.org/10.1016/j.jemep.2018.10.002 [ISSN 2352-5525 (Accessed 2020, October 2)].
- [5] Radoilska L. Public health ethics and liberalism. Public Health Ethics 2009;2:135–45.
- [6] Levy N. Taking responsibility for responsibility. Public Health Ethics 2019;12:103–13, http://dx.doi. org/10.1093/phe/phz001.
- [7] Munthe C. The goals of public health: an integrated, multidimensional model. Public Health Ethics 2008;1:39–52.
- [8] Verweij M, Dawson A. The meaning of 'public' in 'public health' Marcel Verweij & Angus Dawson In Angus Dawson & Marcel Verweij (eds.). Ethics Prevention Public Health 2007:13–29. Clarendon Press. [https://philpapers.org/rec/VERTMO-9].
- [9] Brülde B. Health, disease and the goal of public health. Public Health Ethics 2011;20–47:20–47.
- [10] World Health Organization. Addressing ethical issues in pandemic influenza planning: discussion papers (No. WHO/HSE/EPR/GIP/2008.2). World Health Organization; 2008.
- [11] Smith MJ, Upshur RE. Ebola and learning lessons from moral failures: who cares about ethics? Public Health Ethics 2015;8:305–18.
- [12] Pierce R. The expressive function of public health policy: the case of pandemic planning. Public Health Ethics 2011;4:53–62.
- [13] Ourworldindata.org. Total confirmed COVID-19 deaths. [Retrieved from Ourworldindata.org: https://ourworldindata. org/grapher/total-covid-deaths-region?time=2020-01-11.latest (Accessed 2020, October 2)].
- [14] Everett J, Colombatto C, Chituc V, Brady W, Crockett M. The effectiveness of moral messages on public health behavioral intentions during the COVID-19 pandemic; 2020 [Accessed 2020, October 2] https://psyarxiv.com/9yqs8/download?format=pdf.
- [15] Zangirolami-Raimundo J. Echeimberg J. Leone С. Research methodology topics: cross-sectional 2018;28:356-60 studies. 1 Human Growth Dev http://pepsic.bvsalud.org/pdf/rbcdh/v28n3/pt_17.pdf (2020, October 2)].
- [16] Basias N, Pollalis Y. Quantitative and qualitative research in business & technology: justifying a suitable research methodology. Rev Integrat Business Econ Res 2018;7:91–105 [https://sibresearch.org/uploads/3/4/0/9/34097180/riber_7 -s1_sp_h17-083_91-105.pdf].
- [17] Dyrda L. UK healthcare finds 26 false positive COVID-19 test results due to software flaw: 5 details. University Of Kentucky Healthcare Lab Scientists Found False-Positive COVID-19 Test Results When Reviewing Data From Their Thermo Fisher Testing Platform, Accordi; 2020 [Retrieved from Beckershospitalreview.com.: https://www.beckershospitalreview com/healthcare-information-technology/uk-healthcare-finds-26-false-positive-covid-19-test-results-due-to-software-flaw-5-details.html> (Accessed 7 October 2020)].
- [18] Business news [16:16, Retrieved from: https://www. businessnews.com.tn/falsification-des-resultats-de-tests-ducovid-19-ouverture-dune-enquete, 520,102681,3. (Accessed 29 December 2020)] Falsification des résultats de tests du Covid-19 : ouverture d'une enquête; 2020.
- [19] Gulfnews. Two employees arrested for falsifying COVID-19 test results to enter Abu Dhabi; 2020 [16:33. https://gulfnews.com/uae/two-employees-arrested-for-

falsifying-covid-19-test-results-to-enter-abu-dhabi-1.74213716. (Accessed 29 December 2020)].

- [20] Heneghan C. COVID cases in England aren't rising: here's why-CEBM; 2020 [Retrieved from www.cebm.net:: <https://www.cebm.net/covid-19/covid-cases-in-englandarent-rising-heres-why/> (Accessed 7 October 2020)].
- [21] Berlin G, Bueno D, Gibler K, Schulz J. Cutting through the COVID-19 surgical backlog; 2020 [Retrieved from: https://www.mckinsey.com/industries/healthcare-systems -and-services/our-insights/cutting-through-the-covid-19surgical-backlog#. (Accessed 29 December 2020)].
- [22] Glionna JM. "Avoiding care during the pandemic could mean life or death" Kaiser Health News; 2020 [Retrieved from: https://health.wusf.usf.edu/health-news-florida/2020-08-01/ avoiding-care-during-pandemic-could-mean-life-or-death. (Accessed 29 December 2020)].
- [23] Al-Jabir A, Kerwan A, Nicola M, Alsafi Z, Khan M, Sohrabi C, et al. Impact of the coronavirus (COVID-19) pandemic on surgical practice-Part 2 (surgical prioritisation). Int J Surg 2020;79:233–48.
- [24] Russ M, Sisti D, Wilner P. When patients refuse COVID-19 testing, quarantine, and social distancing in inpatient psychiatry: clinical and ethical challenges. J Med Ethics 2020;46:579–80 [https://jme.bmj.com/content/medethics/46/9/579.full.pdf].
- [25] Lancasteronline editorial board. Consumers should be wary of COVID-19 quackery and price gouging [opinion]; 2020 [Retrieved from https://lancasteronline.com/ opinion/editorials/consumers-should-be-wary-of-covid-19quackery-and-price-gouging-opinion/article_2b47e800-64ae-11ea-813e-cfbd1e9bed07.html].
- [26] Le Mauricien. (Covid-19) Abus des commerçants : 300 contraventions dressées. 7 Avr 18h52; 2020 [Retrieved from https://www.lemauricien.com/actualites/covid-19-abus-des -commercants-300-contraventions-dressees/342658/?fbclid =IwAR11YmLAAuI6WZxssXMrZzICBaeCAKSSP_HGLqDYUFjH-44LoW6hFlmzWPk].
- [27] Newsaf. False COVID-19 News In UAE To Attract \$5,500 Fine; 2020 [Retrieved from Newsaf.cgtn.com.: https://newsaf.cgtn.com/news/2020-04-19/False-COVID-19news-in-UAE-to-attract-5-500-fine-PNGyQQh4vS/index.html> (Accessed 7 October 2020)].
- [28] The National. Abu Dhabi Tightens Testing Requirements, 339 New Covid-19 Cases, Arrests Over Fake Report; 2020 [Retrieved from: http://www.thenational.ae/ podcasts/abu-dhabi-tightens-testing-requirements-339-new-COVID-19-cases-arrests-over-fake-report-the-daily-update-1.1068468> (Accessed 7 October 2020)].
- [29] Healthcare IT News. Dubai Health authority bans rapid viral testing for COVID-19; 2020 [Retrieved from: http://www.healthcareitnews.com/news/emea/dubaihealth-authority-bans-rapid-viral-testing-COVID-19> (Accessed 7 October 2020)].
- [30] Verweij M, van de Vathorst S, Schermer M, Willems D, de Vries
 M. Ethical advice for an intensive care triage protocol in the
 COVID-19 pandemic: lessons learned from the Netherlands.
 Public Health Ethics 2020;13:157–65.
- [31] Littmann J, Viens AM. The ethical significance of antimicrobial resistance. Public Health Ethics 2015;8:209–24, http://dx.doi.org/10.1093/phe/phv025 [Accessed 7 October 2020].
- [32] Verweij M. Preventing disease. Principles Health Care Ethics 2006:557-62.
- [33] Brown MJ, Goodwin J, Liddell K, Martin S, Palmer S, Firth P, et al. Allocating medical resources in the time of Covid-19. N Engl J Med 2020;382:e79.
- [34] Selgelid MJ. Ethics, tuberculosis and globalization. Public Health Ethics 2008;1:10–20.

- [35] Huber SJ, Wynia MK. When pestilence prevails... physician responsibilities in epidemics. Am J Bioethics 2004;4:5–11.
- [36] Tudrej BV, Bommier C. Intégrité scientifique et éthique : un colloque pour réfléchir ensemble aux soins premiers. Ethics Med Public Health 2019;10:51–5.
- [37] Bommier C, Stœklé HC, Haiech J, Forest C, Filliatreau G, Hervé C. 4JIS – The ''bottom-up'' teachings in research integrity. Ethics Med Public Health 2021;16:100618, http://dx.doi.org/10.1016/j.jemep.2020.100618 [ISSN 2352-5525. Accessed 7 October 2020].