

Navigating Ethical Dilemmas in Pandemic Care: Frontline Health Workers' Experiences in Ethiopia

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Abstract

Ethical thinking and awareness are crucial in all areas of public health, but they are even more significant in the delicate, multifaceted field of public health emergency preparedness. This study investigated the ethical issues and moral dilemmas experienced by frontline health workers during the coronavirus disease-19 (COVID-19) pandemic in Ethiopia. A nationwide survey was conducted among frontline health workers at nineteen public hospitals. Participants were asked to fill out a self-administered questionnaire. All data were weighted and evaluated through descriptive statistical methods.

Of the 285 frontline health workers who received the questionnaires, 217 completed and returned them (response rate: 76.1%). Participants frequently described facing difficult rationing choices involving medical supplies needed for COVID-19 prevention and treatment. The majority (83.9%) reported experiencing ethical challenges very often or often. Nearly all [215(99.1%)] reported that shortages of resources directly intended for COVID-19 treatment and prevention were a major issue. The proportion of health workers who faced problems delivering essential clinical services ranged from 77% to 98.7%, depending on the service. More than half of the respondents reported difficulties in providing clinical care on a daily or weekly basis. Among rationing approaches, the creation of separate COVID-19 treatment units and restrictions on hospital admissions were the most commonly used strategies, with two-thirds of health workers using them daily or weekly. Frontline health workers faced a wide range of ethically difficult situations throughout the COVID-19 pandemic. More than half reported ethical difficulties when rationing limited resources and when providing essential clinical services, including family planning services, maternal and child healthcare, immunization, and chronic disease management. With scarce resources such as ventilators and hospital beds, healthcare providers have had to make tough choices about which patients receive access and which do not. In summary, the COVID-19 pandemic created many ethical dilemmas for healthcare professionals, underscoring the critical need for strong ethical awareness in healthcare delivery. Recognizing these challenges and establishing clear policies to manage them can help providers deliver optimal patient care while maintaining high ethical standards.

Keywords: Coronavirus disease 2019, Ethical dilemma, Rationing, Ethiopia

Introduction

Public health emergencies are typically characterized by health demands that far surpass the available human and material resources [1]. Such shortages are especially common in low-resource countries like Ethiopia, where

supply chains are fragile, and resources remain limited. Hard choices must be made about how, when, where, and to whom these scarce resources should be distributed. Although clinical science supplies important data to inform these choices, it is not enough on its own [2]. Applying ethical frameworks to support decision-making can help limit unintended and unavoidable side effects resulting from the coronavirus disease-19 (COVID-19) outbreak [3]. Integrating ethics into pandemic preparedness plans can turn them into instruments that build cooperation and public trust when societies are under severe pressure. Ethical frameworks help ensure that core principles such as accountability, transparency,

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and trust are properly reflected in the decisions that are made [4].

During the COVID-19 pandemic, decisions about rationing resources went far beyond individual patient care. Health authorities sometimes had to ration personal protective equipment (PPE) for healthcare staff [5], while hospital managers needed to decide how best to assign their limited workforce [6]. Clinical information and measurements, though valuable, cannot solve underlying ethical conflicts. Decisions about allocating scarce resources, such as ventilators, to patients who could benefit clinically must occur within a structured triage system. Moreover, such decisions cannot be left to individual doctors or institutions acting independently, as this would lead to inconsistent and unfair outcomes [7]. Clear guidelines and careful consideration of multiple factors are therefore essential for ethical decision-making [8].

The pressure to meet logistical and scientific demands must not push ethical concerns aside [4, 9, 10]. These ethical issues need to be openly discussed because ignoring them can lead to serious problems, such as loss of public confidence, declining staff morale, and confusion about roles and responsibilities [9, 11, 12].

The classic principles of medical ethics (beneficence, nonmaleficence, justice, and autonomy) often fall short in guiding action during extreme events such as pandemics. They must be supported by additional principles to manage the fair distribution of limited resources in crises. Various types of ethical dilemmas currently arise that demand careful evaluation, especially when resources are constrained. One study, for example, suggests applying four additional ethical principles to resource allocation: prioritizing the worst-off, maximizing overall benefit from scarce resources, ensuring equal treatment, and recognizing instrumental value [7]. For this reason, ethical principles and their application require thorough examination to achieve fair and acceptable healthcare delivery.

As the pandemic has continued, new ethical challenges have emerged [13, 14]. COVID-19 raised difficult questions about how to care for non-COVID patients, particularly those with upper respiratory tract infections (URTI), emergency conditions, and dental issues [15, 16]. Because URTI symptoms closely resemble those of COVID-19, affected patients often struggle to receive proper care and support in health facilities. They may also experience stigma from both the community and some healthcare workers. Similarly, patients seeking

emergency dental care frequently do not receive sufficient attention or treatment, especially when PPE supplies are inadequate.

Alongside the surge in PPE demand, there were growing reports of off-label use and hoarding of drugs such as certain antibiotics, paracetamol, and hydroxychloroquine [17, 18]. These actions created ethical uncertainty for pharmacists regarding whether they should dispense such medications. In settings where many drugs are sold without prescriptions, this situation often leads to moral distress among health professionals [19]. Therefore, the present study sought to investigate the ethical dilemmas and difficulties involved in managing patients with high-risk conditions such as upper respiratory tract infections, dental emergencies, and emergency department admissions. It also examined the different forms of ethical challenges related to the distribution of medical supplies directly used for COVID-19 prevention and treatment.

Materials and Methods

Study setting and study design

A national cross-sectional survey was conducted in randomly selected public healthcare institutions across Ethiopia. The research employed a mixed-methods design (combining quantitative and qualitative methods) to gather data. It used a qualitative case study design, an in-depth empirical investigation of a current real-world phenomenon in its actual context. The aim was to examine how the COVID-19 pandemic influenced the ethical provision of specific clinical services and the distribution of health supplies used directly for COVID-19 prevention and treatment. This design supports thorough explanation, description, and in-depth exploration of intricate, multidimensional ethical dilemmas as they occur in everyday practice.

Study site selection and participant recruitment

Purposively chosen healthcare facilities, COVID-19 treatment centers, quarantine centers, and COVID-19 testing centers located in Ethiopia were included in the study. From these sites, the operational project lead invited frontline health workers, coordinators, and supply chain managers to join the research. Participant recruitment followed a structured, stepwise procedure. First, health facilities were purposively selected. Second, rosters of professionals employed in those selected areas or centers were compiled. From these lists, randomly

chosen health workers and coordinators were contacted to obtain their informed consent. In locations where in-person data collection was not practical, the process was carried out via online Google Forms sent to the participants' email addresses. Trained data collectors and interviewers gathered the required information from each individual.

Study population and period

Within the selected healthcare organizations, the target group included health workers directly involved in caring for COVID-19 patients, as well as those stationed in dental clinics, emergency departments, intensive care units, and Ear-Nose-Throat (EENT) clinics. Supply chain managers, COVID-19 emergency operation centers (EOC) coordinators, and other key individuals responsible for allocating health commodities for COVID-19 prevention and treatment were also enrolled. These participants came from COVID-19 EOC units, COVID-19 treatment centers, quarantine centers, pharmacies, emergency units, intensive care units, EENT clinics, and dental clinics. The entire study took place between March 06, 2021, and April 15, 2021.

Data collection procedures

Participants were invited to describe their personal experiences, difficulties, and ethical dilemmas they faced while performing their duties during the COVID-19 outbreak. In-depth interviews incorporating flexible probing questions were conducted to capture information about challenges in service delivery and the management of health commodities. A semi-structured interview guide with open-ended questions was employed. These questions addressed participants' knowledge of clinical ethics, the ethical problems they faced in daily practice, the real-world importance of these issues, and the strategies they used to address them amid the COVID-19 pandemic. Basic information about each participant was also documented. Interviews were held in private offices or separate rooms inside the health facilities to ensure confidentiality. To minimize the risk of COVID-19 transmission during data collection, all recommended infection prevention protocols from the WHO and the Ethiopian Ministry of Health were strictly observed. Appropriate safety measures, including personal

protective equipment, social distancing, and other precautions, were implemented to protect both participants and data collectors.

Data management and statistical analysis

All collected data were coded and entered into EPI data version 3.1, followed by analysis using Stata version 15 statistical software. Quantitative responses were summarized using descriptive statistics. Open-ended responses were examined through a template analysis method. Additionally, a thematic approach combined with SWOT analysis was applied to explore the ethical issues, identify their root causes, and evaluate their effects on service delivery and pandemic control efforts. Prominent themes emerging from each participant's ethical challenges and coping mechanisms were extracted.

Ethical considerations and informed consent

Ethical clearance and approval were secured from the Institutional Review Board (IRB) of the Institute of Health at Jimma University (Reference number: JHRPG/1077/2021). Heads or directors of the selected health facilities were briefed about the study's objectives to obtain their approval and support before commencement. Written informed consent was obtained from each participant after a detailed explanation of the research goals. Complete confidentiality was maintained through anonymous recording and coding systems, with all questionnaires stored securely in locked cabinets.

Results and Discussion

Sociodemographic characteristics of study participants

Of the 285 frontline health workers given the questionnaires, 217 completed them (response rate: 76.1%). The majority of respondents were male (53.5%) and relatively young (mean age 32 years, median age 25 years). Most had fewer than 5 years of professional experience (ranging from 1 to 19 years). In terms of education, more than half held a bachelor's degree, while roughly one-third were medical specialists. Participants often worked very long shifts (mean $\pm$ SD: 63 $\pm$ 25 hours at their current workplace) and cared for a large number of patients each week (**Table 1**).

Table 1. Sociodemographic characteristics of study participants and general information about the study setting. From: Ethical challenges and dilemmas in the rationing of health commodities and provision of high-risk clinical services during the COVID-19 pandemic in Ethiopia: the experiences of frontline health workers

S. No	Variable	Category	Frequency (Percentage)
1.	Gender	Female	101 (46.5)
		Male	116 (53.5)
		Mean $\pm$ SD	32 $\pm$ 21
2.	Age of participants (years)	18–30	79 (36.4)
		31–45	121 (55.8)
		> 45	17 (7.8)
3.	Education level	Diploma	37 (17.1)
		Bachelor's degree	113 (52.1)
		Master's (specialty) and higher	67 (30.8)
4.	Work experience (years)	< 2	57 (26.3)
		3–5	92 (42.4)
		> 5	68 (31.3)
5.	Average weekly work hours	Mean $\pm$ SD	63 $\pm$ 25
		$\leq$ 40 h	29 (13.4)
		40–100 h	121 (55.8)
6.	Work area/position	> 100 h	67 (30.8)
		Intensive Care Unit	47 (21.7)
		Emergency Department	63 (29)
		Inpatient wards	67 (30.9)
		Patient triage unit	27 (12.4)
7.	Professional role (n=217)	Health commodity supply	13 (6)
		Nurse	96 (44.2)
		Physician (MD)	89 (41)
		Dentist	17 (7.8)
		Pharmacist	8 (3.7)
8.	Average number of patients/week	Othera	7 (3.3)
		Mean $\pm$ SD	157 $\pm$ 85 (range 50–850)
9.	Facility type (n = 19)	COVID-19 field hospital	6 (31.6)
		General hospital	9 (47.4)
		Tertiary hospital	10 (52.6)

I. Public health professionals, anesthesiologists

Results from the quantitative analysis

Frontline health workers' experience in managing difficult medical decision-making during COVID-19

The 24 ethically difficult situations were arranged according to how commonly health workers reported facing tough medical decisions during the COVID-19 outbreak. These were organized into eight broad ethical themes.

Eleven of the listed situations were encountered very frequently or frequently by more than half of the frontline health workers. Participants often described facing serious rationing dilemmas involving health supplies needed for COVID-19 prevention and treatment. The most common challenge was the distribution of these supplies; 83.9% stated they very frequently or frequently

had to make hard ethical choices due to limited resources. Almost all [215 (99.1%)] indicated that shortages of items directly used for COVID-19 treatment and prevention — such as PPE, ventilators, and ICU beds — forced them to make difficult decisions. In addition, 83.4% frequently faced dilemmas when patients were unable to pay for the recommended treatment.

Issues such as uncertainty about whether an action would benefit or harm the patient, disagreements within families, worries about family well-being, forced admission of suspected or confirmed COVID-19 cases, and conflicting feelings about treating non-COVID-19 patients with dental issues or upper respiratory tract infections (URTI) were also commonly reported. Most participants observed that many colleagues provided

substandard or unethical care due to insufficient knowledge regarding COVID-19 prevention and treatment. Among all themes, ethical concerns related to end-of-life decisions were the least frequent. Situations

involving withholding or stopping life-sustaining treatment for severely ill or dying patients, along with requests for euthanasia or assisted suicide, occurred among fewer than 15% of health workers (**Table 2**).

Table 2. Percentages of health workers who experienced ethical challenges in managing difficult medical decisions. From: Ethical challenges and dilemmas in the rationing of health commodities and provision of high-risk clinical services during the COVID-19 pandemic in Ethiopia: the experiences of frontline health workers

Situations	Never/Not applicable N (%)	Rarely N (%)	Sometimes N (%)	Frequently N (%)	Very frequently N (%)
A. Doing good or harming					
1. Concerned whether your interventions were helping or harming the patient	12 (5.5)	42 (19.4)	51 (23.5)	62 (28.6)	50 (23)
2. Felt that the patient's treatment needs conflicted with the family's needs or welfare	14 (6.5)	92 (42.4)	28 (12.9)	46 (21.2)	37 (17)
3. Experienced conflict between caring for non-COVID-19 patients with dental complaints	34 (15.7)	81 (37.3)	46 (21.2)	41 (18.9)	15 (6.9)
4. Experienced conflict between caring for non-COVID-19 patients with respiratory tract infection complaints	9 (4.1)	13 (6)	46 (21.2)	59 (27.2)	90 (41.5)
5. Encountered involuntary hospitalization of suspected or confirmed COVID-19 patients	19 (8.7)	24 (11.1)	44 (20.3)	50 (23)	80 (36.9)
B. End-of-life issues					
1. Asked to assist a patient in voluntary euthanasia	198 (91.2)	13 (6)	6 (2.8)	0	0
2. Managed a terminally ill patient where stopping treatment or a "Do Not Resuscitate" order was considered	69 (31.8)	46 (21.2)	18 (8.3)	59 (27.2)	25 (11.5)
3. Withheld potentially life-prolonging treatment to avoid prolonging death and suffering	181 (83.4)	13 (6)	11 (5.1)	7 (3.2)	5 (2.3)
4. Withdrawn life-prolonging treatment to prevent extended dying	145 (66.8)	37 (17.1)	15 (6.9)	11 (5.1)	9 (4.1)
C. Allocation of COVID-19 resources and health commodities					
1. Felt over-treating patients with interventions or tests they would not benefit from	59 (27.2)	72 (33.2)	63 (29)	15 (6.9)	8 (3.7)
2. Restricted treatment to allocate resources to patients more likely to benefit	7 (3.2)	23 (10.6)	52 (23.9)	98 (45.2)	37 (17.1)
3. Could not pursue preferred treatment because the patient could not pay	3 (1.4)	13 (6)	20 (9.2)	73 (33.6)	108 (49.8)
4. Resource limitations for COVID-19 care required difficult decision-making	2 (0.92)	5 (2.3)	28 (12.9)	69 (31.8)	113 (52.1)
5. Experienced disagreement among healthcare workers on patient treatment due to limited resources	10 (4.6)	29 (13.4)	35 (16.1)	93 (42.9)	50 (23)
6. Felt so troubled by limited resources that you regretted choosing your profession	13 (6)	16 (7.4)	27 (12.4)	89 (41)	72 (33.2)
7. Observed a patient contracting COVID-19 due to insufficient healthcare resources	53 (24.4)	87 (40.1)	29 (13.4)	37 (17)	11 (5.1)
D. Conflicting interests					
1. Your preferred treatment plan conflicted with institutional policies, professional ethics, or laws	53 (24.4)	89 (41)	33 (15.2)	28 (12.9)	14 (6.5)
E. Disagreement with patient or family					
1. Noted significant disagreement among family members on ongoing treatment	76 (35)	72 (33.2)	47 (21.7)	16 (7.4)	6 (2.7)

2. Patient's cultural or religious beliefs conflicted with the proposed treatment	67 (30.9)	61 (28.1)	51 (23.5)	20 (9.2)	18 (8.3)
F. Patient capacity to consent					
1. Cared for patients unable to decide for themselves (e.g., unconscious/disabled) and made decisions on their behalf	21 (9.7)	42 (19.4)	71 (32.7)	58 (26.7)	25 (11.5)
G. Unethical or inappropriate care					
1. Witnessed colleagues acting unprofessionally (e.g., dishonest, unfair, or disrespectful)	19 (8.8)	35 (16.1)	81 (37.3)	49 (22.6)	33 (15.2)
2. Observed colleagues compromising care quality due to fear of COVID-19	13 (6)	37 (17)	57 (26.3)	72 (33.2)	38 (17.5)
3. Noticed colleagues providing inadequate care due to insufficient knowledge or skills regarding COVID-19	7 (3.2)	35 (16.1)	74 (34.1)	57 (26.3)	44 (20.3)
H. Disclosure or confidentiality issues					
1. Unsure whether a COVID-19 diagnosis should be disclosed to the patient	18 (8.3)	25 (11.5)	77 (35.5)	33 (15.2)	64 (29.5)
1. COVID-19 Coronavirus Disease-2019					

Difficulty in the provision of essential clinical service delivery

Frontline health workers responded to several questions that started with: "During the COVID-19 pandemic, how often (daily, weekly, monthly, or never) were you unable to obtain or provide the following services for your patients when you felt they were needed?" The difficulty in delivering essential clinical services ranged from 77% to 98.7% across services. Challenges with intensive care

unit admissions, emergency admissions, ventilator and mask availability, and managing patients with respiratory tract infections were most often experienced daily or weekly. More than half of the study participants reported facing problems providing family planning services, maternal and child care, childhood immunization, and chronic disease follow-up and screening on a daily or weekly basis (**Figure 1**).

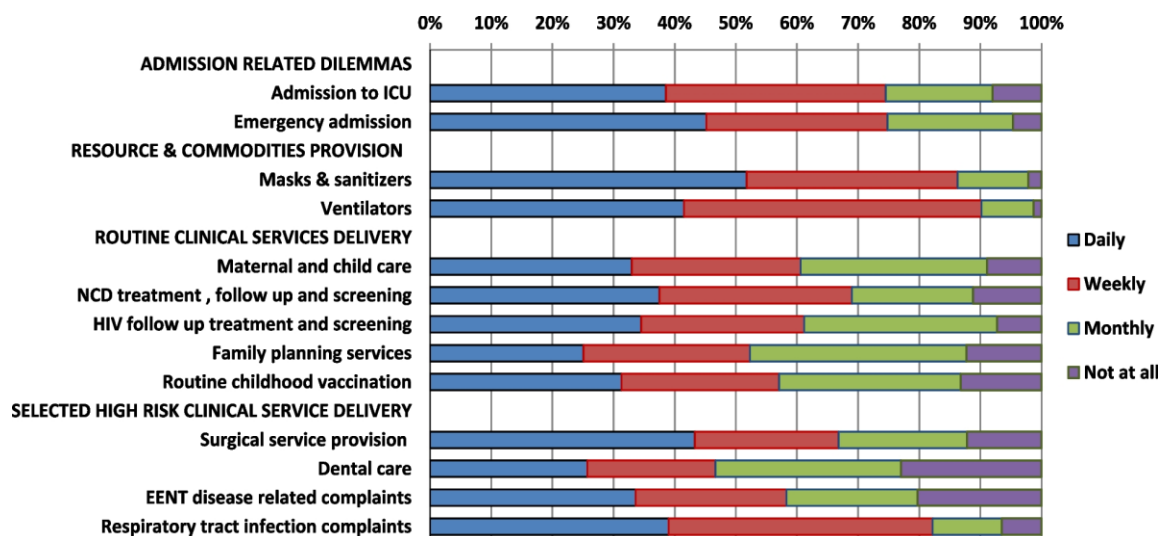


Figure 1. Health care professionals' difficulty in providing essential clinical services during COVID-19. NCD: Non-communicable disease; ICU: Intensive care unit; EENT: Eye, Ear, Nose, Throat; HIV: Human immunodeficiency virus. From: Ethical challenges and dilemmas in the rationing of health commodities and provision of high-risk clinical services during the COVID-19 pandemic in Ethiopia: the experiences of frontline health workers

Strategies for rationing health commodities and admission to health facilities

Frontline health workers applied several different methods to ration medical supplies, control hospital admissions, and manage clinical service delivery. To explore these approaches, participants were asked a set of questions introduced with this stem: “During the COVID-19 pandemic, how often (daily, weekly, monthly, or never) did you try to cut healthcare costs for your facility by ...?” Setting up dedicated COVID-19

treatment units and restricting patient admissions were the most commonly used rationing methods, practiced by two-thirds of health workers on a daily or weekly basis. Sending patients home sooner than ideal, reducing hospital drug supplies, and screening suspected cases were applied less regularly. More than half of the participants routinely cut back on chronic disease follow-up visits and surgical operations as standard measures to limit COVID-19 transmission and ease the overall load on healthcare facilities (**Figure 2**).

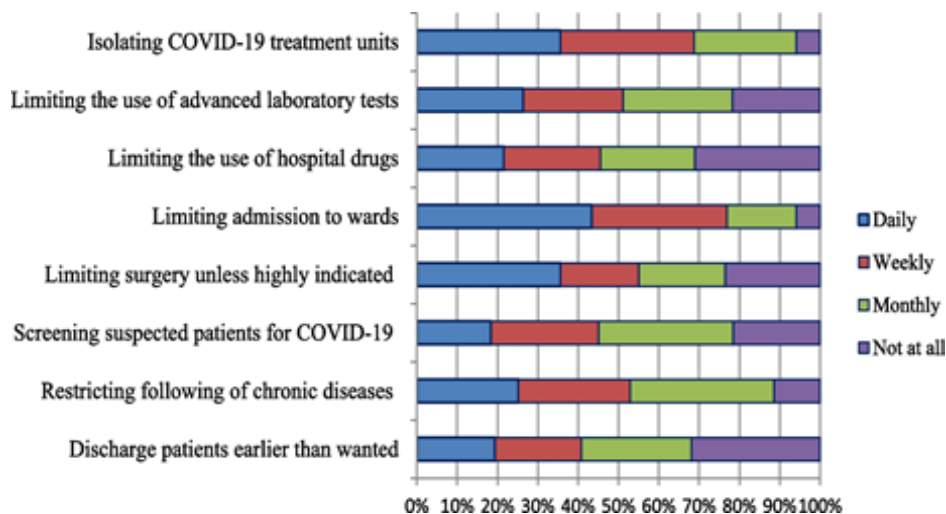


Figure 2. Strategies used by health care professionals/managers to ration the health commodities and admission to health facilities. From: Ethical challenges and dilemmas in the rationing of health commodities and provision of high-risk clinical services during the COVID-19 pandemic in Ethiopia: the experiences of frontline health workers

Results from the qualitative analysis

Of the 217 respondents, 51 answered the open-ended question: “If you have encountered any ethical situations or any other notable ethical dilemma, please briefly describe some of the ethical challenges you are facing or have faced during the COVID-19 outbreak? (Ethical challenges refer to situations that create professional concern or make it hard to determine the correct course of action. This could be something you personally dealt with or heard about from others.” Most gave one or more detailed descriptions, while others listed dilemmas they had experienced themselves or observed in general. Examples from every category of dilemma included in the survey — related to rationing health commodities and delivering clinical services during the COVID-19 pandemic — were provided.

Rationing dilemmas on health commodities during the COVID-19 pandemic

As seen in the quantitative data, the most frequent accounts involved ethical issues in resource distribution, especially those needed to prevent and treat COVID-19. Several health workers highlighted difficulties with supply rationing for supplies used directly for COVID-19 prevention and treatment. The majority of frontline health workers identified limited personal protective equipment as the biggest obstacle. No examples were shared regarding end-of-life ethical issues. The central problem was situations in which patients had competing needs due to a severe shortage of hospital beds. Although such allocation challenges occur even in ordinary times, health workers reported facing them much more often during the COVID-19 emergency. One participant described this as a regular part of his work in the ICU: “It has become a routine part of my daily shifts to turn away emergency patients from needed care, particularly ICU beds, choosing one patient over another according

to their hemodynamic stability. The resources are never sufficient to meet every patient's needs."

Some respondents explained that the "first-come, first-served" rule was usually followed and expressed their disagreement with this method:

"We must do all we can to lessen the impact of the COVID-19 pandemic, but we also need to figure out the best way to distribute scarce medical resources, which is very common here. It is hard to prioritize patients who would benefit the most when many have already been waiting and registered earlier."

However, one ICU physician pointed out problems with the traditional "first-come, first-served" principle that is often used for allocating medical resources:

"We can still apply this principle with few problems when the health system has enough capacity to treat everyone in a reasonable time. But during a major surge of COVID-19 cases, treating all patients equally does not work. I worry that people with connections or relatives working in the facility end up receiving care more easily."

Several participants noted the lack of clear ethical guidelines for certain clinical services. They believed the current national clinical management guidelines for COVID-19 did not properly address the ethical problems that arose during the crisis. One gynecologist described the challenges in this way:

"There were no clear guidelines available to guide clinical decisions when serious ethical dilemmas occurred during these uncertain times. For instance, we lacked surgical triage protocols to assess patients for operations. We mostly relied on individual judgment or on senior doctors' group decisions. One case I recall involved a termination of pregnancy (abortion) that was not an emergency, but delaying it led to a later gestational age and higher risks for the patient."

Dilemmas concerning the delivery of essential clinical services

In line with the quantitative findings, the majority of health workers indicated they struggled to provide maternal and child healthcare, follow-up treatment and screening for NCDs and HIV, routine childhood immunizations, and family planning services throughout the COVID-19 pandemic.

Following Klein *et al.*'s [20], six established rationing strategies, frontline health workers adopted multiple approaches. One widely used method involved patient selection and discontinuation of services. Those working

in triage, emergency departments, and ICUs frequently chose patients most likely to benefit from admission, or deliberately raised the bar for hospital entry. This aligns with the quantitative data, which show that nearly three-fourths of participants reported using admission restrictions as a major rationing tool. One participant explained it this way:

"We made every effort to protect our scarce emergency and ICU beds by carefully assessing each patient's overall condition and the number of free beds available. Factors such as sufficient PPE, sanitizers, bed availability, and the patient's existing health issues — particularly chronic respiratory problems like asthma or COPD, and diabetes — often played a key role in deciding who could be admitted."

Concerns about the spread of COVID-19 severely disrupted care for patients arriving with respiratory complaints. As reflected in the quantitative results, nearly one-third of health workers faced ethical dilemmas when treating individuals with these symptoms. An emergency nurse working in triage shared her experience:

"Especially in the initial months of the COVID-19 outbreak, nearly all of us felt uncomfortable assessing patients who came in with fever, cough, or any signs of acute febrile illness. These symptoms overlapped so much with COVID-19 that we hesitated. Consequently, those patients often became extremely anxious and ended up not receiving proper attention or treatment for their real health problems."

The COVID-19 outbreak, which originated in China in December 2019, has spread quickly across the globe, infecting more than 137 million individuals and causing around 3 million deaths by mid-April 2020 [21, 22]. Competence remains a core ethical obligation in everyday clinical practice [23]. Generally, professionals should avoid performing tasks outside their area of expertise. Any real, potential, or perceived conflict of interest must be openly disclosed to the patient [24-26]. Public health crises affect all of these ethical principles. During a pandemic, the usual standards governing healthcare delivery no longer apply in the same way [27-29]. Healthcare workers are confronted with life-and-death choices: which patients will receive treatment and which will not? Hospital capacities are stretched beyond limits, and many medical personnel are themselves becoming infected with the virus. As a result, it is impossible to provide care to every patient. In serious pandemics, it may be necessary to ask both health professionals and non-medical staff to temporarily

perform duties beyond their formal qualifications or competence.

During the COVID-19 pandemic, three primary ethical responsibilities were identified for healthcare leaders: the duty to plan (which involves handling uncertainty), the duty to safeguard (supporting staff and protecting at-risk groups), and the duty to guide (establishing contingency and crisis standards of care) [30]. The present study revealed that frontline health workers across all surveyed healthcare facilities faced ethical challenges. Patient disagreement with the suggested treatment for non-religious or cultural reasons occurred less often, as did conflicts among family members regarding continuation of treatment. In contrast, hesitation about disclosing a COVID-19 diagnosis was more common among Ethiopian frontline health workers. These ethical issues arose across various levels of healthcare delivery. Comparable findings were reported in an earlier study conducted across four European countries (Norway, Switzerland, Italy, and the UK) [31] and in Ethiopia [32]. This pattern suggests a more paternalistic approach to healthcare, where decisions are largely left to the discretion of health workers.

In this study, nearly three-quarters of health workers felt so distressed by the lack of resources that they regretted choosing their profession. Comparable research from Israel [33, 34], Jordan [35], the USA [36], and Italy [37, 38] indicated that the shortage of essential medical supplies for preventing and treating COVID-19 caused significant fear among health workers when caring for infected patients. Shortages of both healthcare resources and personnel were already well documented in low-income settings, including Ethiopia, even before the pandemic. These shortages stemmed from multiple factors, including insufficient supplies, inadequate healthcare infrastructure, limited intensive care capacity, and limited access to proper guidelines and protocols.

Resource scarcity, especially in developing nations, often leads to difficult ethical dilemmas. These may involve prioritizing treatment for the most critically ill patients while deferring care for those with more stable conditions [39]. Making such choices can result in moral injury or psychological distress for some health workers [40]. Nearly all participants in the study stated that restricted resources for COVID-19 treatment and prevention forced them to make tough decisions. A central concern during the pandemic has been that the overall disease burden could surpass the available healthcare capacity. Even in high-income countries, there were serious worries that

healthcare systems might collapse if COVID-19 cases surged sharply [41]. For instance, hospitals in the USA, Italy, and South Korea experienced critical shortages of N95 masks, ventilators, and ICU beds, contributing to numerous preventable deaths [42-46].

Roughly half of the participants reported observing health workers delivering substandard care due to insufficient knowledge and skills in COVID-19 prevention and treatment. This situation is likely linked to limited resources, inadequate training, and an overall shortage of healthcare staff. Healthcare systems in developing countries have struggled significantly during this period and have often been unable to meet required standards of care [7]. Ethical justification for actions taken during emergency preparedness must meet very high standards; the required adjustments are frequently disruptive, far-reaching, and financially burdensome. Public health emergencies generate intense pressure, particularly on physicians who are unaccustomed to working under emergency conditions with constrained resources. An effective ethical framework for healthcare during public health crises must reconcile the commitment to patient-centered care—which typically emphasizes clinical ethics—with the realities of emergencies [46, 47].

Under normal circumstances, clinical care is patient-centered, with ethical decisions aligned as closely as possible to the individual patient's preferences and values. However, a public health emergency—such as a sudden increase in people seeking care along with a large number of critically ill COVID-19 patients or those with other severe respiratory conditions—interrupts the usual mechanisms that support ethically appropriate patient care. In the current study, more than three-quarters of frontline health workers reported difficulties in delivering essential clinical services across multiple areas. Challenges in providing intensive care unit services, emergency admissions, ventilator, mask, and sanitizer availability, and managing patients with respiratory tract infections were most frequently experienced daily or weekly. These findings align with previous studies from Hong Kong [48], India [49], Italy [38], and the USA [50]. Likewise, more than half of the frontline workers reported difficulties in delivering family planning services, maternal and child care, childhood immunization, and chronic disease follow-up on a daily or weekly basis. This is consistent with research conducted in various countries, including the USA [51], Qatar [52], India [51], and the UK [53].

The COVID-19 pandemic has presented particular difficulties for women's health and has revealed the risk of deprioritizing women's healthcare, with potentially serious long-term effects. In this study, more than 50% of participants reported problems in the delivery of family planning services and maternal and child care. These issues highlight important ethical concerns regarding women's healthcare during the pandemic. Consistent with findings from the USA [54], women from disadvantaged backgrounds were disproportionately affected in accessing essential services. Although data on maternal or fetal complications remain limited [55, 56], the majority of maternal and child health (MCH) services were delayed or suspended due to concerns about viral transmission.

As observed in the USA [54], the pandemic also created obstacles to the provision of surgical services. Almost two-thirds of frontline health workers reported they could not provide routine surgical care to their patients. This reflects international guidance recommending the postponement of elective or non-urgent surgeries to reduce the risk of infection and preserve medical supplies, particularly personal protective equipment (PPE), in areas heavily affected by COVID-19 [57-59].

As the COVID-19 pandemic worsened, ventilator shortages emerged worldwide, particularly in nations experiencing the highest caseloads, such as Italy and the USA [7, 60]. In the present study, more than 90% of frontline health workers faced dilemmas regarding access to ventilators for patients who needed them. This situation complicated ICU admissions and overall patient management. The health demands generated by the coronavirus pandemic far exceed hospitals' capacity, even in developed countries [61]. Consequently, this creates a major ethical challenge in allocating critical resources, such as mechanical ventilators, PPE, and other essentials, in resource-limited settings like Ethiopia, which already suffer from underfunded and underdeveloped health systems. The goal of public health is to improve population health by reducing illness and death through the efficient use of available resources and strategies. In emergencies, it may be necessary to restrict individual rights and preferences to protect the wider population. During disasters, health workers often confront hard choices about who receives limited life-saving resources. Public health ethics helps navigate the tension between individual and community needs. Although expert panels have outlined the ethical principles that should inform such decisions, these

principles have not been sufficiently examined in the context of frontline health workers operating in actual health facilities.

This study offers multiple strengths. As far as the authors are aware, it ranks among the earliest research efforts to examine the ethical dilemmas arising in clinical service provision and the distribution of medical supplies specifically needed to prevent and treat COVID-19. A mixed-methods design was used, allowing quantitative results on ethical concerns to be supported by an in-depth exploration of frontline health workers' actual experiences. Moreover, the research was conducted as a country-wide survey, generating nationally representative data on the issue. That said, several limitations should be noted. The study excluded primary care health facilities, including primary hospitals and health centers. These settings already faced significant resource shortages and service delivery difficulties even before the arrival of COVID-19, and the pandemic likely worsened those problems. Furthermore, the research did not incorporate the viewpoints of patients or their relatives, who might have different ethical concerns and expectations regarding healthcare during the crisis. Subsequent investigations could address these perspectives to deliver a fuller understanding of the ethical issues affecting healthcare systems throughout the COVID-19 pandemic.

Conclusion

Frontline health workers experienced numerous ethically complex situations while responding to the COVID-19 pandemic. More than half of them described ethical difficulties when allocating scarce resources and when delivering essential clinical services, including family planning, maternal and child care, immunization programs, and ongoing management of chronic conditions. One of the most pressing ethical problems during the COVID-19 pandemic has been ensuring fair distribution of the limited resources available to patients. Faced with shortages of critical items such as ventilators and hospital beds, healthcare teams have been forced to make hard choices about which patients gain access to these resources and which ones do not. Both outpatient and inpatient services — including standard hospital admissions and non-emergency surgical procedures — have been sharply reduced or put on hold.

In summary, the COVID-19 pandemic has posed a wide range of ethical challenges for healthcare professionals,

underscoring the importance of considering ethical principles when providing medical care. By acknowledging these dilemmas and developing clear policies to handle them, providers can strive to deliver optimal patient care without compromising ethical standards. Continued research and further refinement of relevant policies will be crucial to fully embed ethical considerations into healthcare practices during public health emergencies such as this pandemic.

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