

## RESEARCH ARTICLE

# The Challenges of Medical Technologists during COVID-19 Specimen Collection

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## ABSTRACT

**Background:** The coronavirus disease, also known as COVID-19, is a highly contagious disease caused by a new strain of the coronavirus SARS-CoV-2. Medical technologists, along with doctors and nurses, are also heroes in the fight against the virus as they risk their own health in order to collect and analyze specimens for the diagnosis of the disease. However, they face numerous challenges along the way.

**Objectives:** This study aimed to better understand the difficulties of medical technologists assigned to collect COVID-19 specimen in tertiary hospitals or laboratories in Metro Manila, Philippines.

**Methodology:** Utilizing the qualitative case study design, the researchers interviewed 14 medical technologists and examined the data according to Colaizzi's method which consisted of grouping and categorizing relevant remarks before formulating themes.

**Findings:** The researchers were able to formulate the following themes: (1) patient-related challenges, namely, attitude, age, health status, and communication; (2) physical challenges, namely, fatigue, work hours, number of patients, and the use of personal protective equipment; (3) environmental challenges, namely, collection setting, temperature, and exposure to the virus; (4) resource challenges, namely, supplies and human resources; and (5) psychological challenges, namely, fear, anxiety, and emotional fatigue.

**Conclusion:** The study was able to analyze the obstacles faced by COVID-19 specimen collectors in order to give a means of hearing from and comprehending their viewpoints. This shows the importance of performing regular reviews of healthcare workers to ensure their safety. Medical technologists and their supervisors should be able to communicate effectively in order to improve current standards and procedures.

**Keywords:** *medical technologist, COVID-19, specimen collection, case study, Philippines*

## Introduction

The coronavirus disease, or more commonly known as COVID-19, is a highly infectious disease caused by a new strain of coronavirus called SARS-CoV-2. With the emergence of the COVID-19 pandemic and millions falling victim to the highly infectious virus, both the diagnosis and treatment of the disease have become every country's top priority. The medical technology industry is critical to the global response to the COVID-19 pandemic. The major responsibility of medical technologists is to collect biological samples for testing. The pandemic, on the other hand, has made specimen collection more difficult for medical technologists because it necessitates more experience, training, and quality equipment to avoid contracting the virus. These problems,

together with increased workload and a lack of resources, all contribute to the overall challenge that each medical technologist faces. The use of personal protective equipment (PPE), supply, staffing, communication and coordination, and workplace culture are some of the themes formulated with regards to the key factors of the COVID-19 outbreak [2]. A study found that the unavailability of guidelines was among the institutional barriers experienced by healthcare workers. Furthermore, lack of communication and support from the community and government, and shortfall attention and recognition for the staff were also among the perceived barriers by the healthcare workers due to the pandemic [3]. There are also several significant implications of the pandemic

on the mental conditions of healthcare workers due to the COVID-19 pandemic. Anxiety, stress, fear, suffering, depression, and turmoil were some of the psychological problems associated with the onset of the pandemic [4, 5].

Several studies on the lived experiences and issues faced by frontline healthcare workers have been done. However, there is still a scarcity of studies concentrating on medical technologists, who are among the most critical healthcare personnel during the pandemic. Because they come into contact with patients during specimen collection, these medical technologists are at a very high risk of contracting the virus. The study's goal is to offer a detailed account of the obstacles faced by medical technologists during COVID-19 specimen collecting. The purpose of this study was to qualitatively describe the day-to-day obstacles faced by medical technologists assigned to COVID-19 specimen collecting. This was done to give a channel for hearing and comprehending medical technologists' concerns, as well as to aid in the development of a program to provide physical, emotional, and psychological support to the medical technologists assigned to COVID-19 specimen collection.

## Methodology

### *Research Design*

This study used a qualitative, single case methodology to better understand and focus on the varied experiences and views of medical technologists during COVID-19 specimen collecting. The case study design enabled the researchers to get detailed information from respondents about a specific scenario or incident. This enabled them to highlight their difficulties and share their varied experiences on COVID-19 specimen collection. Additionally, this strategy enabled the researchers to gather extra data and material that may have been missed by other sources such as journal articles and the like.

### *Respondents and Study Site*

A total of 14 medical technologists from tertiary hospitals or laboratories in Metro Manila were selected through non-probability purposive sampling. Creswell (1998) advises 5-25 respondents for case studies because thematic saturation, the point at which no new themes or conclusions emerge, is typically reached between 5-25 interviews. [8]. Qualitative research focuses on a small number of well-chosen samples, and the researchers chose 14 respondents with a wealth of information who could discuss their issues and life experiences.

Respondents were chosen using the following criteria: (1) registered medical technologist with at least one year of work experience; (2) employment in a tertiary hospital or laboratory in Metro Manila; and (3) assignment to collect COVID-19 swab specimens. Because the research was done during the COVID-19 pandemic, respondents were predominantly contacted by email and other means of internet communications. Additionally, those who met the requirements and expressed interest in participating in the study received an official letter of invitation through email.

### *Data Gathering Procedure*

To ensure that all facets of the phenomenon were covered, an in-depth semi-structured interview was undertaken. Interview guide questions were used to direct the researchers and facilitate the collection of data from the respondents, as well as to ensure that all parts of the subject were addressed with each respondent. These enabled the researchers to elicit and document the respondents' experiences with COVID-19 specimen collecting. Due to the current COVID-19 pandemic, the researchers conducted the data collection via online interviews through the programs ZOOM or Google Meet, whichever is more convenient for the respondents.

The researchers gained consent from the University of Santo Tomas Faculty of Pharmacy's ethics review committee to perform the study, which was coded as FOP-ERC-2021-02-174. Following clearance, each respondent received a formal invitation via email that included a set of questions and a Google Forms link that took them to an online consent form and a questionnaire used to collect demographic information for the research. The researchers ensured that the respondents were adequately informed and understood the study's goal and procedures and that they consented to participate in the study voluntarily. Permission was also secured to record the meeting prior to the interview. To ensure the respondents' complete secrecy and anonymity, code names were issued to each respondent. The interviews took place in April and May 2021. Following the data analysis, all screen recordings of the interviews were destroyed in accordance with the Philippine Data Privacy Law.

### *Data Analysis*

This was accomplished by the application of Colaizzi's approach of analysis. This method produces a concise but in-depth analysis of the "lived experiences" surrounding the events under investigation. This process included familiarity with the acquired data, identification of significant statements,

formulation of meanings, groupings of recognized themes, construction of a thorough description, creation of a fundamental structure, and verification of the structure by all respondents [9]. The researchers familiarized themselves with the data by reading all of the transcripts numerous times, following Colaizzi's methodology. Significant statements were discovered and themes developed. The researchers were able to arrange the remarks into themes using MAXQDA, resulting in a repertory grid. To validate the data, the researchers read and reread the respondents' statements to ensure that they properly comprehended and understood the respondents' issues. Additionally, the transcribed interviews were returned to the respondents, and their comments were considered to ensure that their experiences were accurately documented.

## Findings

The demographic profile of the respondents is presented in Table 1. Male medical technologists accounted for more than half of those interviewed (57%). In terms of age, the majority of responders are between the ages of 21 and 25. (57%). The majority of participants (57%) have worked in their current position for 0-2 years, four of whom worked (29%) for 3-4 years, one (7%) for 5-6 years, and the last one (7%) for more than 6 years. Overall, majority of the respondents (86%)

**Table 1. Demographic Data of the Respondents**

	f	%
<b>Gender</b>		
Male	8	57
Female	6	43
<b>Age</b>		
21-25	8	57
26-30	5	36
31-35	0	0
36-40	0	0
41-45	0	0
46-50	1	7
51-55	0	0
55-60	0	0
<b>Months working as a COVID-19 Specimen Collector</b>		
0-2	0	0
3-4	1	7
5-6	1	7
More than 6 months	12	86
<b>Years working in current workplace</b>		
0-2	8	57
3-4	4	29
5-6	1	7
More than 6 months	1	7

worked as COVID-19 specimen collectors for more than six months, whereas two worked for three to four months and five to six months, respectively.

The study concentrated on the broad range of issues encountered by medical technologists and the recurring motifs that emerged from each challenge. This resulted in the development of a taxonomy of the obstacles faced by medical technologists assigned to collect specimens for COVID-19 by classifying the respondents' verbalizations and categorizing them according to the themes and subthemes with which they are linked (see Table 2). Included in this table are the five kinds of challenges encountered by medical technologists, namely, patient-related challenges, physical challenges, environmental challenges, resource challenges, and psychological challenges.

### Patient-related Challenges

Patient-related problems refer to the difficulties and hardships encountered by medical technologists when interacting with patients during specimen collection (Table 3a). These factors include the patient's attitude, age, ability to communicate, and health status.

#### Attitude

Attitude, which refers to a patient's conduct, way of thinking, and manner throughout the specimen collection process, is one of the primary difficulties that healthcare staff face during a pandemic, as verbalized:

**Table 2. Taxonomy on the Challenges of Medical Technologists in COVID-19 Specimen Collection**

CHALLENGES	FORCES
<b>Patient-related Challenges</b>	Attitude Age Communication Health Status
<b>Physical Challenges</b>	Fatigue Work Hours Number of Patients Use of Personal Protective Equipment (PPE)
<b>Environmental Challenges</b>	Collection Setting Temperature Exposure to Virus
<b>Resource Challenges</b>	Supplies Human Resources
<b>Psychological Challenges</b>	Fear Anxiety Emotional Fatigue

**Table 3a. Patient-related Challenges**

THEME	REPRESENTATIVE QUOTES
<b>Attitude</b>	<p>“There was this PBA player that I swabbed, shouted at me, cursed me because the swab was painful and he even said to the other players that I am the worst, do not go to me cause I am the worst swabber, something like that.”(MT-05)</p> <p>“May mga patients kasi na parang kapag ino-orient mo sila sa gagawin, sobrang takot, sobrang magalaw.” [“There are some patients wherein, while you orient them, they are very scared, very fidgety.”] (MT-06)</p> <p>“May mga patients kasi na ma-attitude, minsan ginagawa mo lang yung trabaho mo tapos aawayin ka pa o magagalit pa sila sayo kasi nasasaktan sila sa swab.” [“There are some patients who have an attitude. Sometimes, you are just doing your job, then suddenly somebody quarrels with you or they get angry because they feel pain while swabbing.”] (MT-13)</p>
<b>Age</b>	<p>“Especially with the age of 3-7 years old, they are the ones na pinakamahirap talaga i-restrain yung mga children na ganoong age because they are so powerful. When it comes to elderly naman, the thing is, madalas nilang i-resist yung ulo nila so there are times na mamimiss ka” [“Especially with the age of 3-7 years old, they are the ones that are the hardest to restrain because children at that age are so powerful. When it comes to the elderly on the other hand, the thing is, they can't resist moving their heads most of the time, so there are times where you will miss”] (MT-05)</p> <p>“So dealing with the patients, yung nga yung sinabi ko before yung sa mga pediatric patients. It took me a lot of time to convince the baby or the toddlers to cooperate with the process kasi hindi mo sila pwedeng biglain lang” [“So dealing with the patients, as I have said before, it's the pediatric patients. It took me a lot of time to convince the baby or the toddlers to cooperate with the process because you can't just suddenly spring this up on them”] (MT-09)</p>
<b>Communication</b>	<p>“Ang naging problem lang sa akin is yung mga ibang lahi. Like Chinese, Malaysians, ayun syempre paano mo i-explain yung procedure sa pasyente.” [“The only problem I have is when there are foreigners. Like Chinese and Malaysians, how would I explain the procedure to the patients?”] (MT-04)</p> <p>“Siguro yung challenges is sumisigaw sila pag kinakausap yung patient, kasi di magkarinigan kasi may barrier pa. ‘Tas maliit lang yung butas.” [“I think the challenges are when you need to speak louder when speaking to the patient because you can't hear each other because of the barrier. And that the hole is too small.”] (MT-14)</p>
<b>Health Status</b>	<p>“Nag hahandle pala kami ng cadaver. So last week, yung isang coworker ang na handle niya as in ano, duguan yung patient, like parang 3 days na siya patay sa loob ng room niya, sa 3rd day palang nalaman kasi umamoy na, so malansa na diba pagka matagal na cadaver yung bangkay.” [“We also handle cadavers. So last week, I had a coworker who handled one wherein it was really bloody like it's been 3 days since they died in their room. They found out on the 3rd day because it started to smell. It's smelly since it's been 3 days.”] (MT-01)</p> <p>“Naka-swab po ako ng cadaver, patay, ayun ang kawawa, yun yung nag stood out talaga na natty ko” [“I have swabbed from a cadaver, a dead body, I felt sad, that's what stood out to me the most.”] (MT-07)</p> <p>“For me, mas difficult yung sometimes hindi mo kasi alam na yung pasyente mo is a bleeder, na experience ko kasi na one time na stop ko siya sa ilong, pag hugot ko po ng pang-swab, mayroon nang pinch of blood. Then pagtingin ko sa pasyente, may lumalabas na dugo.” [“For me, it's difficult sometimes when you don't know that your patient is a bleeder. I had one experience wherein when I stopped at the nose and pulled the swab, a pinch of blood was present on it. When I looked at the patient afterwards, blood was leaking from their nose.”] (MT-11)</p>

There was this PBA player that I swabbed, shouted at me, cursed me because the swab was painful and he even said to the other players that I am the worst, do not go to me cause I am the worst swabber, something like that.”(MT-05)

When it comes to attitude, respondents described how they were frequently ridiculed or mistreated for attempting to execute their jobs, as MT-05 and MT-13 in Table 3a stated. Additionally, several respondents remarked that the reaction was due to the patients' suffering during the treatment. As a

result, it is clear that the practice of COVID-19 specimen collecting is not confined to the technique itself, but also the various methods of patient care and management of diverse scenarios.

#### Age

As stressed by MT-05 and MT-09, the patient's age, whether pediatric or geriatric, played a significant role in influencing the difficulty of specimen collection (Table 3a). For

youngsters, particularly those between the ages of three and seven, MT-05 stated that specimen collectors are occasionally unable to restrain their patients due to their overwhelming strength. Additionally, MT-09 stated that obtaining their participation would be a lengthy and arduous process. For geriatric individuals, on the other hand, it was said that a lack of collaboration resulted in the technique being hampered, hence impairing the specimen's overall quality. Additionally, the age factor is an inescapable component that adds to the complexity of specimen collecting, particularly considering its inability to be controlled.

### Communication

The process of transmitting information and directions during specimen collection is called communication. The respondents described their experiences of attempting to communicate with their patients, which was occasionally hampered by language problems or their usage of personal protective equipment (PPE), as revealed by MT-04 and MT-14 (Table 3a). Regarding language obstacles, MT-04 stated that explaining the technique got challenging due to the inability to

communicate vital information about the specimen collection procedure. On the other side, MT-14 underlined that the primary obstacle impeding their capacity to communicate was the use of personal protective equipment which made it difficult for the patient to hear and understand the medical technologists and vice versa.

### Health Status

As one of the patient-related problems associated with COVID-19 specimen collection, health status refers to the patient's state during specimen collection (especially if the patient is alive or deceased), or even the patient's vulnerability to bleeding during specimen collection. Given that multiple responders mentioned the difficulty of swabbing a cadaver, it is clear that the operation can have a negative effect on their mental health, as MT-01 said (Table 3a).

### Physical Challenges

The physical difficulties are barriers that can hinder one's capacity to carry out the COVID-19 specimen collection

**Table 3b. Physical Challenges**

THEME	REPRESENTATIVE QUOTES
<b>Fatigue</b>	<p><i>“Dahil sa sobrang bigat ng workload, sobrang stressful. As in yung pagod sagad talaga, feeling mo binugbog ka talaga” [Because the workload is very heavy, very stressful. As in, it's really over tiring like someone knocks you out”] (MT-13)</i></p> <p><i>“Siguro yung burnout talaga, super. Pagkatapos ng work mo matutulog ka na pero kinabukasan ganun ulit. Sobrang bigat ng ginagawa.” [“I think it's really the burnout. After work, you'll rest but the next day it's the same. The workload is very heavy.”] (MT-14)</i></p>
<b>Work Hours</b>	<p><i>“There are times we go on overtime and we have to do some things that we are not really familiar with. So I think that is the difficult part, that we always have to adapt to the change.” (MT-10)</i></p> <p><i>“Nag-OT ka na nga ng hanggang gabi tapos pag nagpapahinga ka na bigla kang tatawagin” [“You work overtime until night, then while even you're resting they'll still call you”] (MT-14)</i></p>
<b>Number of Patients</b>	<p><i>“Kada tao is mga around 70-80 patients, so nakakapagod din” [“Each person (medical technologist) has around 70-80 patients, so it's really exhausting.”] (MT-04)</i></p> <p><i>“Sobrang dami talagang patients na idi-deal mo especially with company sizes of patients which we've done in the past, still do right now, and admittedly it pushes us to our limits” [“There are really a lot of patients you have to deal with especially with company sizes of patients which we've done in the past, still do right now, and admittedly it pushes us to our limits”] (MT-02)</i></p>
<b>Use of Personal Protective Equipment (PPE)</b>	<p><i>“Dun mo mararamdaman yung pawis, half-day palang basang-basa na yung scrub suit. Sa loob pa, naka-coverall naman.” [“That's when you'll feel the sweat. You've only spent half of the day but your scrub suit is already wet [from sweat]. Then inside, you'll have to wear a coverall.”] (MT-04)</i></p> <p><i>Whenever you go outside the laboratory, you need to wear PPE, which is very uncomfortable and more difficult on our part since you can't move freely just like before.” (MT-05)</i></p> <p><i>“Kasi kailangan naka full PPE ka kapag specimen collection, tapos sobrang init, tapos kailangan talaga naka respirator.” [“Because you have to wear full PPE in the specimen collection, then it's really hot, then you also have to wear a respirator.”] (MT-13)</i></p>

procedures successfully. The medical technologists were hindered by weariness, work hours, the number of patients, and the use of personal protective equipment (Table 3b).

### *Fatigue*

Fatigue is a feeling of exhaustion that can be caused by a variety of circumstances including stress and work-related issues. According to MT-14, the majority of respondents reported feeling exhausted as a result of their physically demanding jobs as frontline employees. MT-14 underlined that the burnout felt repetitious as it lasted for several days, as verbalized:

“Siguro yung burnout talaga, super. Pagkatapos ng work mo matutulog ka na pero kinabukasan ganun ulit. Sobrang bigat ng ginagawa.” I think it's really the burnout. After work, you'll rest but the next day it's the same. The workload is very heavy.”] (MT-14)

### *Work Hours*

Work hours refer to the amount of time an employee spends each day in their area of work. The pandemic has expanded healthcare personnel's responsibilities and work hours, creating various situations that may need medical technologists to work extra. MT-14 even recounted being summoned to work following an overtime shift.

### *Number of Patients*

The patient count reflects the number of individuals seen by medical technologists on a daily basis. Apart from the extended work shifts, the growing number of patients served and assisted by medical technologists was identified as a physical difficulty, as shown by the MT-02, MT-04, and MT-11 in Table 3a. These responders highlighted that as the COVID-19 situation in the country unfolds, the increasing number of patients has pushed them to their limitations. The ratio of healthcare personnel to patients can be exceedingly daunting especially when one medical technologist may be responsible for as many as 70-80 patients per day, as MT-04 reports.

### *Use of Personal Protective Equipment (PPE)*

Personal protective equipment (PPE) is any item or garment worn by healthcare professionals to protect them from injury or infection. Some of the respondents stated that wearing a full set of PPE is uncomfortable since it causes

breathing difficulties and excessive sweating, as well as prevent them from working more comfortably.

### *Environmental Challenges*

Environmental challenges (Table 3c) describe the problems due to the condition of the surroundings such as temperature, collection setting, and exposure to the SARS-CoV-2 virus.

#### *Temperature*

Temperature considerations are primarily linked to the heat associated with the Philippines' climate. Given that swabbing outdoors and wearing full protective equipment is virtually always required for COVID-19 specimen collection, as stated in MT-12 (Table 3c), this is one of the most frequently discussed environmental problems. The usage of PPE in conjunction with the high heat outside is particularly challenging, as practically every respondent indicated.

#### *Collection Setting*

The term "collection setting" refers to the many locations where specimens are collected such as an indoor setting, a patient's apartment, or a car, each of which has distinct drawbacks. As verbalized by MT-05, some medical technologists collect specimens at the patients' homes and must travel between them. This was thought to be a significant burden on the specimen collector's shoulders. When it comes to laboratories, which are enclosed environments, respondents expressed concern about their general safety:

Barring closed rooms where almost every piece of air conditioning, even the small electric fan, comes with a HEPA filter and a high grade at that, and even then I have very, very big reservations about enclosed spaces for COVID-19 swabbing in general. It's because I do not like it, the longer COVID-19 patients stay in a single room, the more likely anyone else is going to catch it.” (MT-02)

#### *Exposure to Virus*

Exposure to viruses describes the vulnerability experienced by the medical technologists to SARS-CoV-2. With the increasing number of patients each day, exposure to the virus remains to be a major cause for concern among specimen collectors. Both MT-09 and MT-12 shared that this risk of

**Table 3c. Environmental Challenges**

THEME	REPRESENTATIVE QUOTES
<b>Temperature</b>	<p><i>"We have to waste such a good cooling from the aircon by opening the doors and windows in our workplace just to maintain an assemblance of good quality airflow so that COVID-19 can easily be shunted out" (MT-02)</i></p> <p><i>"Stressful siya kasi naka-suot ka ng napakainit at outdoor ka pa nagsswab" ["It's very stressful because it is very hot with what you are wearing, and you swab outdoors"] (MT-12)</i></p>
<b>Collection Setting</b>	<p><i>"Barring closed rooms where almost every piece of air conditioning, even the small electric fan, comes with a HEPA filter and a high grade at that, and even then I have very, very big reservations about enclosed spaces for COVID-19 swabbing in general. It's because I do not like it, the longer COVID-19 patients stay in a single room, the more likely anyone else is going to catch it." (MT-02)</i></p> <p><i>"Minsan hindi lang isang bahay pero dalawa o tatlong bahay. All the burden is being passed on you o sa kung sino man assigned na specimen collector at that time" ["Sometimes, it's not only 1 house, but 2-3 houses. All the burden is passed on you or whoever is the specimen collector assigned at that time"] (MT-05)</i></p>
<b>Exposure to the Virus</b>	<p><i>"We are exposed talaga doon sa virus mismo, so we don't know the gauge of danger na hinaharap natin" ["We are really exposed to the virus, so we do not know that gauge of the danger that we are facing"] (MT-09)</i></p> <p><i>"Siyempre yung exposure kasi anytime pwede kaming maging COVID-19 positive din" ["Of course, the exposure because anytime, we can turn out positive for COVID-19 as well"] (MT-12)</i></p>

exposure is constant, and the danger they face can, at any time, cause them to acquire the infection.

### Resource Challenges

The resource constraints refer to the difficulty faced by medical technologists in getting an adequate set of PPE to shield themselves from the infection. This includes the workforce required to maintain a safe work environment for healthcare professionals and to offer safe patient care. Table 3d summarizes the data from these studies. Respondents described their concerns with both facets, and both of these difficulties underscored the critical nature of having an effective management structure in place when addressing these issues.

#### Supplies

MT-06, MT-12, and MT-13 (Table 3d) all narrated experiences in lacking supplies such as masks and PPEs, requiring them to adjust in whatever way they can. Whether using masks of lower quality or borrowing from other departments, every situation shows how the safety of specimen collectors can become compromised if there are inadequate supplies provided.

#### Human Resources

Human resources are often referred to as a workforce made up of individuals; making up an organization, business sector, industry, or economy. They provide the labor needed to accomplish tasks for the organization. The lack of staff

and shortage of healthcare workers may lead to being given additional workload, as verbalized by MT-04 (Table 3d).

### Psychological Challenges

Psychological difficulties are impediments that affect how an individual thinks, conducts, feels, and responds to his/her surroundings. Additionally, the COVID-19 epidemic has posed psychological difficulties for healthcare professionals. Among the psychological difficulties encountered by respondents are dread, anxiety, and emotional exhaustion, as summarized in Table 3e.

#### Fear

Fear, in this context, is attributed mainly to the danger and risks brought by COVID-19. Medical technologists expressed their fear of getting the virus due to the line of work they have as stated by MT-09 and MT-12 (Table 3e). Fear was the first thing that came to mind when the respondents were first assigned to collect specimens for COVID-19. They experience fear not only for themselves (MT-12, Table 3e) but also for their family (MT-11, Table 3e).

#### Anxiety

In the context of COVID-19 specimen collecting, anxiety mostly refers to the respondents' feelings of nervousness throughout the specimen collection process. This was confirmed in this study as well. Direct interaction between the healthcare staff and patients has been shown to enhance

**Table 3d. Resource Challenges**

THEME	REPRESENTATIVE QUOTES
Supplies	<p><i>"We end up borrowing stock from other departments. Oh Lord, it has come to the point that minsan nang-hiram na nga kami ng glove boxes sa nurses' station"</i> [<i>"We end up borrowing stock from other departments. Oh Lord, it has come to the point that we had to borrow boxes of gloves from the nurses' station"</i>] (MT-02)</p> <p><i>"Limited ang supplies especially with PPE so you only have 1 PPE for your whole shift."</i> [<i>"The PPE supplies were limited, so we had to use 1 PPE for the whole shift."</i>] (MT-05)</p> <p><i>"Nagkaroon pa ng hoarding ng mga mask so parang nagkulang kami when it comes to the masks"</i> [<i>"There was this instance when people hoarded masks so our stocks were limited"</i>] (MT-06)</p> <p><i>"Hindi na kami na-provide-an ng complete PPE"</i> [<i>"We weren't provided complete PPE"</i>] (MT-12)</p> <p><i>"Yung isa sa mga challenges na naranasan ko is sati naubusan ng N95, so surgical mask lang yung gamit."</i> [<i>"One of the challenges we faced was when we ran out of N95, so we had to use surgical masks instead."</i>] (MT-13)</p>
Human Resources	<p><i>"Since understaffed ako lahat may hema ako, may chemistry ako, ER, warding"</i> [<i>"Since we're understaffed, I'm assigned in different departments like hematology, ER, chemistry, and warding"</i>] (MT-04)</p> <p><i>"Kasi we have to double up our shift dahil nga kulang yung tao"</i> [<i>"We have to double up our shift because we lack people"</i>] (MT-09)</p>

**Table 3e. Psychological Challenges**

THEME	REPRESENTATIVE QUOTES
Fear	<p><i>"But at the same time nakakatakot sya kasi tayo yung frontline"</i> [<i>"But at the same time, it's frightening since we are frontliners"</i>] (MT-09)</p> <p><i>"First matatakot ka eh kasi una iniisip mo makasagap ka ng virus, madala mo sa family mo"</i> [<i>"At first, you'll be afraid because the first thing that will come to your mind is catching the virus and spreading it to your family"</i>] (MT-11)</p> <p><i>"Natatakot ako kasi malaki chance na mahahawaan kami"</i> [<i>"I'm scared because there's a high chance that we'll be infected"</i>] (MT-12)</p> <p><i>"Natakot din ako nung first month kasi may kasama din kami na nag positive"</i> [<i>"I was also scared during the first month because we were with someone who tested positive"</i>] (MT-14)</p>
Anxiety	<p><i>"Pinakamahirap to kasi lahat ng med tech nagkaroon na ng anxiety"</i> [<i>"This is the hardest because all med techs [medical technologists] had already experienced anxiety"</i>] (MT-03)</p> <p><i>"Kakabahan ka talaga as you swab, mapa-oral man yan or naso."</i> [<i>"You'll really be nervous as you swab, whether it is oral or naso [nasopharyngeal]."</i>] (MT-04)</p>
Emotional Fatigue	<p><i>"I think somehow, it lessened your self-confidence"</i> (MT-05)</p> <p><i>"Bukod sa physically affected ako, emotionally drained din ako"</i> [<i>"Aside from being physically affected, I was also emotionally drained"</i>] (MT-03)</p> <p><i>"Mahirap din sa part ko, kasi syempre nakaka-affect din ng emotional health"</i> [<i>"It's also difficult on my part because of course it also affects emotional health"</i>] (MT-12)</p>

anxiety levels, as indicated in MT-03 and MT-04 (Table 3e). These respondents stated that they were frequently nervous whenever they collected swab specimens. Additionally, respondents expressed their anxiety and concern in the light of the countless healthcare personnel who died as a result of the infection.

#### *Emotional Fatigue*

In this study, emotional tiredness refers to the psychological anguish caused by the pandemic's negative stress. As mentioned by MT-05, emotional exhaustion can also impair an individual's ability to concentrate on his/her



work (Table 3e). The interviewees' shared experiences included the phrases "emotionally drained" and "burnout."

## Discussion

It has emerged from the interviews that medical technologists have given that each one reflects a distinct challenge that they have faced and described. According to previous research, many of these issues have been encountered in other situations. In addition to examining the overall health and well-being of medical technologists, each issue is critical in determining and assessing what may be improved.

### *Patient-related Challenges*

Among the patient-related challenges mentioned by the respondents, it is clear that specimen collection for COVID-19 is heavily focused on dealing with various attitudes and situations in which there is not always a predetermined method to respond. Patient handling may be one of the most significant variables contributing to the overall difficulty of collecting specimens for COVID-19. Dealing with patients was also identified as a significant issue in a research done about the lived experiences of Filipino nurses during the pandemic. According to this study, some patients may employ words or acts that appear menacing to these nurses [10]. According to several respondents, this could be due to the agony felt by patients throughout the surgery. Patients often flinch or react because the specimen collection process (specifically, nasopharyngeal swab) is known to cause discomfort. Furthermore, the discomfort may cause the patient to cough or sneeze. While the treatment is relatively painless, most patients report discomfort. This uneasiness or discomfort may cause the patient to lash out at the specimen collector. In accordance with this, it is clear that patient handling has become an increasingly problematic aspect of specimen collection, particularly during the pandemic's peak. The rising problems for the medical technology industry, in particular, illustrate that mastering the practice entails not only learning the ability to perform tests or treatments but also mastering people skills and dealing with various sorts of patients.

In relation to the multiple contacts with pediatric patients described by the respondents, children are known to cooperate in varying degrees, and they are also known to find the procedure stressful and seek reassurance from the specimen collector [11]. As a result, multiple issues occur on the side of the medical technologist, who is entrusted with dealing with a variety of scenarios and communicating with

patients in a variety of ways in order to get their consent for the process. This factor, in particular, has no apparent remedy and is frequently left to the medical technologists themselves to choose how to alleviate the situation, adding to their difficulty.

In terms of communication, the respondents' experiences are similar to those of a research conducted on the lived experiences of healthcare professionals during the epidemic. Respondents in this study emphasized the burden of having a barrier between them and their patients [4]. Respondents expressed frustration at not being able to communicate with their patients. As a result, proper communication must be maintained to guarantee that the specimen collection procedure is not jeopardized.

Finally, the respondents identified patient health status as a significant rising challenge. The handling of dead bodies might result in psychological anguish due to the handling of cadavers, risk of infection, and likely lack of support from management [12]. According to a phenomenological study of healthcare workers' lived experiences during the COVID-19 epidemic, the deaths of patients also generated emotional anguish and grief, as well as a sense of failure on the part of the responders [13]. Apart from dealing with cadavers, the rising difficulty of dealing with patients dubbed "bleeders," as highlighted by MT-11 (Table 3a), is a significant component in COVID-19, adding to the challenges faced by medical technologists. The SARS-CoV-2 virus can infect cells via the angiotensin-converting enzyme-2 (ACE-2) receptor, which is abundant in the respiratory system, notably the nose. Furthermore, the tissue and mucosa around the nasopharyngeal swab site are known to be delicate [14]. These factors increase the patient's vulnerability to bleeding during the swabbing procedure.

### *Physical Challenges*

With regard to the physical difficulties described by the respondents, several of the themes are related to the ongoing workload and overall increase in patient numbers caused by the pandemic. Since the outbreak of the COVID-19 pandemic began, healthcare systems, particularly frontline employees, have been under tremendous strain. It is critical to remember that medical technologists are also human and may feel overwhelmed by the circumstances.

Unusual and stressful conditions are frequently recognized to result in sleeplessness, weariness, or burnout. As a result of these symptoms, the risk of daytime tiredness, medical and mental illnesses, and impaired immunological response

increases [15]. Employee busyness and weariness are viewed as antecedents of professional burnout which diminishes employees' ability to perform their job in stressful settings [16]. The quick growth of COVID-19 cases has significantly increased the workload of healthcare staff, with the majority of them now working longer hours and taking on more obligations in comparison to their pre-pandemic schedules and responsibilities. Healthcare personnel on the frontlines have a higher risk of physical and mental health problems as a result of excessive workload, lack of preparation, and emotional discomfort. As a result, individuals face higher risks to their physical and mental health as a result of their excessive workload, lack of preparation, and emotional discomfort [17]. Prior to the pandemic, longer work hours were previously recognized as a factor contributing to exhaustion which has been linked to an increased risk of laboratory injuries [18].

Increased COVID-19 cases result in an increase in hospital admissions and patients. Patient preparation and handling may have an effect on the collection of adequate specimens. As such, it is critical for healthcare staff to maintain a healthy state of mind while engaging with patients. According to a study, healthcare staff who have been in direct touch with COVID-19 patients over an extended period of time have the greatest psychological strain. Additionally, employment strain, including increasing workload, is a frequent source of psychosocial burden [19].

In terms of personal protective equipment, healthcare professionals are mandated to wear PPEs due to the significant risk of airborne transmission associated with specimen collection. Without adherence to established standards, the risk of infection would increase. Certain types of personal protective equipment are known to be fluid-resistant and impermeable by nature, reducing heat loss. This aspect, in conjunction with the PPE's weight and restricted mobility, may contribute to an increased risk of heat stress and, finally, thermal strain [20]. Apart from the increased workload caused by the COVID-19 pandemic, a study discovered that full PPE is also a factor in increased physical weariness among healthcare professionals [13]. When used collectively, these elements may have a detrimental effect on the user's performance and well-being.

### *Environmental Challenges*

Environmental concerns stated by respondents are particularly problematic in that there are frequently no viable

alternatives given the Philippines' climate. These difficulties were nearly often mentioned in conjunction with the use of PPE, as the two factors combined to make specimen collection for COVID-19 more difficult. While a cooler working space may aid to alleviate pain and decreased performance associated with the use of complete PPE and external temperature, collecting COVID-19 specimens outdoors is preferred due to the increased ventilation [19-21].

Several dangers associated with specimen collection include patients coughing during swabbing which may contaminate the sample chamber. Thus, air purification and proper and consistent surface disinfection are critical [21]. As some respondents have noted, the right collection configuration must be considered in order to reduce virus spread. Additionally, the numerous places which medical technologists must visit in order to collect specimens has arisen as a significant issue in the collection of COVID-19 specimens. COVID-19 specimens are typically collected in the patient's home, at a drive-thru or tent testing location, or in other conventional healthcare settings.

Preventing viral transmission is a priority in all specimen collection procedures and protocols. Continuous patient handling and specimen collection, on the other hand, represent a serious risk to healthcare workers during the COVID-19 epidemic. While the discovery of virus particles does not necessarily indicate the presence of active infection, the many modes of SARS-CoV-2 transmission pose a risk to patients and healthcare workers [1]. Frontline healthcare personnel, in comparison to the general population, are at a higher risk of contracting COVID-19 due to the continual collecting of specimens and interaction with possible COVID-19 positive individuals.

### *Resource Challenges*

Resource constraints, in particular, can be addressed through effective communication and management. While different laboratories may have varying experiences with resources, the sudden increase of COVID-19 cases has resulted in a shortage of critical resources in numerous COVID-19 testing centers.

Medical technologists assigned to specimen collection are already at a significant risk of infection with SARS-CoV-2 due to their close interaction with patients. Healthcare personnel who lack suitable and adequate personal protective equipment (PPE) are more likely to become ill [23]. When a drop in healthcare supply is combined with a

rise in demand for treatment, healthcare becomes unreliable, lowering both the quality and amount of care available. This indicates that administrative measures must be taken to ensure that laboratories and hospitals have an adequate supply of resources to safeguard the safety of their healthcare professionals.

As the COVID-19 pandemic advances, staffing shortages emerge as a result of healthcare personnel exposure, illness, or the necessity to care for family members at home. Adequate staffing must be maintained to ensure a secure work environment for healthcare personnel and safe patient treatment. However, as a result of overburdened healthcare systems, extended work hours, tiredness, and acute psychological stress, healthcare workers are at a heightened risk of transmitting COVID-19 [23]. As a result, patients who may not even be infected but are swabbed for specimen collection face an increased risk of infection from worn-out medical technologists.

### *Psychological Challenges*

With the advent of psychological difficulties encountered by medical technologists during COVID-19 specimen collection, it becomes clear that the burden is not limited to physical aspects alone but also to mental ones. According to a previous study, the most common psychological hurdles encountered by clinical laboratory workers during the pandemic were fear, worry, and depression [5]. Fear of infection spreading to family, friends, and colleagues was one of the pandemic's early psychological consequences for healthcare workers. The primary source of worry for COVID-19-infected healthcare professionals is their fear of contracting the infection and transferring it to their family. These anxieties were among the pandemic's acute psychological consequences [13].

Healthcare professionals' anxiety levels for COVID-19 are observed to be elevated in bad working and social conditions [26]. Anxiety, worry, and exhaustion can all have a profound effect on one's cognition and decision-making [5]. Problem-solving abilities, including decision-making, are required to resolve any challenges encountered during the pre-analytical phase, such as specimen collecting, that may affect the results later.

Healthcare personnel are vulnerable to emotional discomfort as a result of the pandemic's risk and work demands. Emotional exhaustion was observed to be greater among medical workers assigned to locations with a lower risk of COVID-19 infection than among those assigned to

areas with a higher risk [27]. There was an increase in psychological discomfort among healthcare personnel as a result of the pandemic, including weariness and burnout [7]. Physically and psychologically fatigued healthcare personnel are more likely to make errors, whereas psychological anxiety can impair the quality of patient treatment [28]. These psychological difficulties, among others, underscore the critical nature of administrative efforts to ensure good communication with healthcare staff.

## **Conclusion**

The study's findings indicate that medical technologists faced a variety of challenges during the COVID-19 pandemic, including the following: (1) patient-related challenges, such as attitude, age, communication, and health status; (2) physical challenges, such as fatigue, work hours, patient volume, and the use of personal protective equipment; (3) environmental challenges, such as collection setting, temperature, and exposure; and (4) resource challenges, such as supplies and human resources.

For future researchers interested in doing similar or comparable studies, a larger sample size and a broader scope may result in a more realistic picture of the difficulties encountered by COVID-19 specimen collectors. Additionally, because medical technologists are no longer the only ones responsible for COVID-19 specimen collection, another perspective on the issues of specimen collection could be gained by interviewing other personnel assigned with COVID-19 specimen collection. These may include registered nurses or graduates of health-related studies who have undergone Department of Health-sponsored training.

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