



## The Impact of COVID-19 on Ophthalmology Training and Services in Selected Public Hospitals in Addis Ababa, Ethiopia

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### Abstract

**Introduction:** COVID-19 pandemic is having a huge impact in our personal and professional lives. For Ophthalmology department there was a huge gap on the training programs and services as almost all elective activities, procedures and services were interrupted in our units.

**Objectives:** To assess the impact of the COVID-19 pandemic on ophthalmology training and services in public Hospitals in Addis Ababa, central Ethiopia.

**Methods:** A cross-sectional study was conducted at selected public hospitals delivering ophthalmology training and services in Addis Ababa from December 2021 to June 2022. Convenient sampling was used to select study areas. The study had two arms. One arm of the study focused on collection of data using structured questionnaire from ophthalmic health professionals who are working and passing through the pandemic. Another arm of the study is focused on collection of data from the registry of the hospitals and will try to make a comparison b/n the data before the start of the pandemic and after beginning of the pandemic.

**Results:** A total of 120 participants completed the questionnaire. More than two third of the respondents reported that they had some psychological impact due to the pandemic in their profession. A total number of comprehensive outpatient visit seen within 12 month decreased by 20% compared to the pre - COVID-19 era. A total number of major OR surgeries within 12 months was decreased by 57.4% compared to the pre-COVID-19 era. A total number of minor procedures done within 12 months reduced by nearly 50%. Major ophthalmology services were largely affected during the first 4 month of the pandemic.

Total number of emergency visit within 12 months was reduced by 56% compared to the pre- COVID pandemic era. More than one third of the participants 45(37.4%) rate the negative impact of COVID-19 on academic training such as extension of training periods (12(10%)), extension of residency matching programs (7(5, 8%)), decreased elective procedures (22(18.3%) and decreased patient flow (4(3, 3%)).

**Discussion:** The finding of this study on comprehensive outpatient visit, major and minor surgeries on the first 4 month after the pandemic was higher than the study done in UK, Queen's Medical Centre, (on June 2020) done by Darren ShuJeng Ting., et al. And similar with the study done in Egypt by Abdullatif., et al. Academic training was compromised due to the pandemic.

**Keywords:** SARS-CoV-1; COVID-19; Personal Protective Equipment (PPE)

## Acronyms and Abbreviations

OPD: Out Patient Department; MICS: Manual Small Incision Cataract Surgery; NCT: Non Contact Tonometry; SPHMMC: St. Paul's Hospital Millennium Medical College

## Introduction

### Background

Severe acute respiratory syndrome (SARS) is a viral respiratory disease of zoonotic origin caused by severe acute respiratory syndrome corona virus (SARS-CoV-1); the first identified strain of the SARS corona virus species. The syndrome caused the 2002–2004 SARS outbreaks. Around late 2017, Chinese scientists traced the virus through the intermediary of Asian palm civets to cave-dwelling horseshoe bats in Yunnan [1].

SARS was a relatively rare disease; at the end of the epidemic in June 2003, the incidence was 8,422 cases with a case fatality rate (CFR) of 11%. No cases of SARS-CoV-1 have been reported worldwide since 2004 [2,3].

The COVID-19 pandemic is an ongoing pandemic of corona virus disease 2019 (COVID-19) caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan city [4].

Symptoms of covid-19 may appear 2-14 days after exposure to the virus. It produces flu-like symptoms and may include fever, muscle pain, lethargy, cough, sore throat, and other nonspecific symptoms. It spread through respiratory droplets in the air; either inhaled or deposited on surfaces and subsequently transferred to a body's mucous membranes. The average incubation period for SARS is 4–6 days [4].

Many public health interventions were made to try to control the spread of the disease. These interventions included earlier detection of the disease; isolation of people who are infected; droplet and contact precautions; and the use of personal protective equipment (PPE), including masks and isolation gowns. A screening process was also put in place at airports to monitor air travel to and from affected countries [5].

The COVID-19 pandemic greatly affected the healthcare utilization service due to the lockdown and health facilities overwhelmed with COVID-19 patients. A WHO survey found that health services

have been partially or completely disrupted in many countries globally but low-income countries are most affected [6].

### Statement of the problem

The WHO World declared COVID-19 as a world pandemic on March 11, 2020. As of May 27, 2020, 213 countries were affected with >5.5 million infected and >0.35 million deaths worldwide. The overall case fatality rate (CFR) of COVID-19 is around 6.36%, trailing that of Severe Acute Respiratory Syndrome (SARS) (9.6%) and Middle East Respiratory Syndrome (MERS) (34.4%) [7].

Ethiopia's first case of COVID-19 was confirmed on March 13, 2020, and the country has seen just over 99,000 cases as of November 1, 2020. More than 75 percent of cases have been reported in Addis Ababa and its surrounding areas [8,9].

Up to March 2021 there was 47,517 new cases, taking the total number of confirmed cases to 206,589. The death totally rises to 2,865. The number of recovered patients increased to 158,109, leaving 45,613 active cases at the end of the month [10].

The COVID-19 pandemic is a global health threat to the general population as well as healthcare workers. Ophthalmology represents one of the busiest and most heavily outpatient-oriented specialties. COVID-19 pandemic lockdown had resulted in cancellation of thousands of ophthalmic clinical visits and surgeries, which could potentially lead to permanent and significant harm to patient's vision [11,12].

COVID-19 has also affected all levels of the education system, from per-school to tertiary education, mainly due to a decrease in workforce across all academic sectors, as well as due to measures to prevent the spread of the virus. Even though didactic teaching can continue via virtual learning, practical aspect of the education including surgical skills of residents was affected [13,14].

In Ethiopia, the national government declared a five-month state of emergency in April 2020 that will have effect on of health care utilization [15].

In Ethiopia most eye health units have suspended eye examinations for fear of spreading the COVID-19. Services are limited to managing injury-related eye emergencies. Elective ocular surgery has been suspended all over the country, and people presenting to eye units with bilateral blindness from cataract, for example, are being turned away, even if surgery would improve vision [16].

Even though currently most ophthalmology units are delivering different services there is still a gap created due to continued impact of COVID-19 pandemic. Therefore, it is important that efficient measures are implemented during and after the COVID-19 pandemic to avoid any irreversible sight loss among patients.

There is no published research on impact of COVID-19 pandemic on ophthalmic training and service delivery at public hospitals in Addis Ababa, Ethiopia.

### Significance of the study

Huge gap is created on ophthalmology training and services due to COVID-19 pandemic. The study focused on training and ophthalmic service delivery during the pandemic.

The result of this study would be helpful on improving and designing appropriate preventive measures, and will help to suggest options and set strategies on academic training and services during COVID-19 pandemic. The study also useful as a baseline study for other researchers.

### Literature Review

On the 31 December 2019, 27 cases of pneumonia of unknown etiology were identified in Wuhan City, Hubei province in China. According to reports, the ophthalmologist Dr. Li Wenliang first recognized the symptoms of severe acute respiratory syndrome corona virus 2 (now known as corona virus disease 2019 (COVID-19)) in seven of his patients, while developing the disease himself and eventually passed away on 7 February 2020 [17].

COVID-19 pandemic brought a major impact on delivery of health care system. Ophthalmologists are at a higher risk of the infection due to a number of reasons including the proximity between doctors and patients during ocular examinations, micro aerosols generated by the non-contact tonometer, tears as a potential source of infection, and some COVID-19 cases present with conjunctivitis [18].

The AAO released recommendations on the on March 18, 2020, that all ophthalmologists should cease providing treatment other than urgent care in clinics and hospitals. The recommendation would result in significant disruption to the continuity of ophthalmic care for large number of patients [19].

Different studies are conducted on the impact of covid-19 on ophthalmology services worldwide on different countries. Accord-

ing to the study done on the impact of COVID-19 pandemic on ophthalmology services in Queen's Medical Centre, UK (on June 2020) showed that there was 63% and 67% reduction in the outpatient and surgical activities, respectively compared to the same month before COVID-19. Cataract surgery is most commonly performed procedure in ophthalmology. Cancellation of routine ophthalmic service has resulted in a significant increase in the cataract surgery backlog during the COVID pandemic [20].

Another comparative study done on the effect of the stay-at-home Policy on Ophthalmology outpatient clinic applications during the Covid-19 Pandemic at Turkey similarly detected a reduction of 56% in the number of patients admitted to the ophthalmology clinic in the pandemic period compared to the non-pandemic period [21].

Another cross-sectional study done by Haney Mahmoud on the impact of COVID-19 on ophthalmology in Egypt (2020) including ophthalmologists showed that the majority of the participants (81.5%) thought that the lockdown had a detrimental effect on the progression and follow-up of chronic diseases (e.g. glaucoma) [22].

A study done in Egypt by Abdullatif, *et al.* On Change in ophthalmology practice during COVID-19 pandemic Egyptian perspective on 2021 noted that ophthalmic surgeries reduced by 80%–100% [23].

Different studies also shows that outpatient emergency visits were less frequent during the COVID – 19 pandemic as compared to before COVID 19.

A comparative study on Ophthalmic emergency-room visits during the Covid-19 pandemic at Meir Medical Center in Israel, found that the number of OER visits during the COVID – 19 pandemic was reduced by 43% as compared to the same month on previous year. Moon, *et al.* also found a 32% decrease in the total volume of OER visits in 2020 compared to prior years [24,25].

The COVID-19 pandemic has caused an unprecedented disruption in medical education and healthcare system worldwide [26].

Breazzano, *et al.* reported that ophthalmology was among the specialties with the highest proportion of residents with confirmed COVID-19 across all residency programs in New York. Concerns for the possible increased risk of infection in ophthalmic practice re-

quire extra precautionary measures. Droplets, close contact, and aerosols are the most common routes of COVID-19 transmission [27].

According to the study on impact of COVID-19 on ophthalmic specialist training in the United Kingdom on June 2020 showed that, 39% of the trainees were redeployed to specialties outside of ophthalmology, with 77% concerned about the impact of redeployment on training and 86% were concerned about the impact COVID-19 would have on training [28].

On the same study cataract surgery is their biggest concern (80%). The pandemic also result in postponement of The Royal College of Ophthalmologists postgraduate examinations [28].

Another other Descriptive survey-based study done on Impact of the COVID-19 Pandemic on Ophthalmology Residency Training in Portugal by Nisa Silva, *et al.* (2020) showed that The COVID-19 pandemic has significantly influenced the training of ophthalmology residents nationwide. Most Participants highly agreed with the extension of the residency program (80%) in order to make up for training disruption [29].

A study done on Psychological impact of COVID-19 on ophthalmologists-in-training and practicing ophthalmologists in India by Rohit C Khanna, *et al.* (April 15 to April 19, 2020) showed that 52.8% felt that COVID-19 would impact on their training or professional work and 32.6% had some degree of depression [30].

In Ethiopia Diversion of health workers and resources to direct COVID-19 response activities compromised the health facilities' capacity to deliver essential services. It has very significant health implications for a country with high burden of blindness from preventable and treatable conditions [31,32].

## Objectives

### General objective

To assess the effect of COVID-19 on major ophthalmology service and academic training in selected public hospitals in A.A.

### Specific objectives

To compare ophthalmology services before and after COVID-19 in selected public hospitals To assess the impact of COVID-19 pandemic on ophthalmology academic training.

## Methods and Materials

### Study area

Addis Ababa is the capital city of Ethiopia, which holds 527 square km area in Ethiopia. It is densely populated town with having 4.8 millions of people in 2020 [33].

In A.A there are five governmental eye centers including SPHMMC, Minilik hospital, Alert hospital, Ras Desta Damtew hospital and Tirunesh Beijing General Hospital.

The study conducted in SPHMMC, Ras Desta and Alert hospitals located in the capital city, Addis Ababa which are delivering major eye care services. Saint Paul's Hospital Millennium Medical College (SPHMMC), and Ras Desta Damtew Memorial Hospital (RDDMH) established in 1969 [34].

SPHMMC is one of the largest teaching hospitals under the federal ministry of health with 392 beds, an annual average of 200,000 patients, and a catchment population of over 5 million. Likely, RDDMH is a general hospital under the city government with a total number of 550 staff, 168 beds [35].

ALERT hospital is also one of the leading specialized hospitals in dermatology, ophthalmology, plastic and reconstructive surgery along with other health care facilities and a center of excellence providing blended comprehensive leprosy and TB/HIV training in the nation [36,37].

### Study period

The study was conducted from December 2021 to June 2022 G.C.

### Study design

A cross sectional study is used. The study had two arms. One arm of the study focused on collection of data using structured questionnaire from ophthalmic health professionals who are working and passing through the pandemic. Another arm of the study is focused on collection of data from the registry of the hospitals and will try to make a comparison b/n the data before the start of the pandemic and after beginning of the pandemic.

### Study population

All ophthalmic health professionals.

### Sample size

All ophthalmic health professionals will be included in the study.

### Sampling technique and sampling procedure

Convenient sampling is used to select the study areas.

### Eligibility criteria

#### Inclusion criteria

- Ophthalmologists, Residents
- Cataract surgeons, Optometrists
- Ophthalmic nurses and BSC nurses

#### Exclusion criteria

Health professionals on annual leave or graduated.

Newly employed health professionals working for < 6 months.

### Variables

#### Dependent variables

Impact of COVID-19 on ophthalmology training  
Impact of COVID-19 on ophthalmology services.

#### Independent variables

Sociology-demographic variables

- Age/Sex
- Job
- Marital status

### Data collection and procedures

After preparing, a structured format, all available ophthalmic health professionals filled the questionnaire.

The number of patients seen and number of surgeries done within one year after covid-19 pandemic were tallied and filled. For comparative purpose, patients seen one year before the COVID-19 pandemic were also tallied and filled. Data collected with trained personnel and the purpose of the study fully explained.

### Operational definitions

- Impact; Refers to how a consequence of some action is going to affect someone, something, or a marked effect that usually has negative outcomes.
- Residency; Refers to a qualified physician (one who holds the degree of MD) who practices medicine, usually in a hos-

pital or clinic, under the direct or indirect supervision of a senior medical clinician registered in that specialty such as an attending physician or consultant.

- Major ophthalmic surgical procedure; Refers to procedure that need an aseptic technique and environment to decrease chance for significant inadvertent microbial contamination and can be done with or without operating microscope.
- Minor ophthalmic surgical procedure; Refers to procedure that need a minimal access intervention (which is either a therapeutic or diagnostic procedure and done without the help of operating microscope.
- Clinic; is a health facility that is primarily focused on the care of outpatients.

### Data quality

Data collectors trained about data collection technique demonstrated on the data collection and supervised while collecting the data. Data carefully filled in the format, checked for completeness and crosschecked for accuracy.

### Data analysis

The responses to the questionnaire collected and the following outcome measures evaluated in view of the COVID-19 pandemic: (1) Psychological, professional and health impact of COVID-19 pandemic (2) Impact on major clinical services (3) Impact on training.

Data analyzed using SPSS for windows version 26 and result displayed with tables, graphs and text.

### Ethical consideration

Ethical clearance written from SPHMMC, student research program office to the respective eye centers. The objectives of the study briefed and documents kept confidential.

### Results

#### Demography of participants

One hundred twenty participants completed the questionnaire. Sixty-six (75%) of them were females. Mean age was 32.35 (SD 7.6) years (Table 1).

#### Psychological impact of the pandemic and adaptation measures taken

More than two third of the respondents (85%) reported the pandemic brought some psychological impact on their profession. There were some adaptation measures taken during the pandemic

| Demographic features |                   | Frequency (%) |
|----------------------|-------------------|---------------|
| Profession           | Ophthalmologists  | 18(15%)       |
|                      | Optometrists      | 14(11.7%)     |
|                      | Ophthalmic nurses | 10(8.3%)      |
|                      | BSC nurses        | 44(36.7%)     |
|                      | Cataract surgeons | 2(1.7%)       |
|                      | Residents         | 32(26.7%)     |
| Gender               | Male              | 30(25%)       |
|                      | Female            | 90(75%)       |
| Marital status       | Married           | 65(54.2%)     |
|                      | Single            | 53(44.2%)     |
|                      | Divorce           | 2(1.6%)       |

**Table 1:** Demography of health professionals at public hospitals, A.A, Central Ethiopia.

like PPE and taking COVID-19 vaccination. But only 35% of respondents were getting adequate PPE supply (Mask, hand washing, and sanitizers) as a preventive measures for COVID-19 pandemic and more than half 71( 59.1%) of the respondents were took COVID-19 vaccine but only 50(41.6%) of them took complete dose.

**Impact on clinical services**

It was noted that (17(14.2%) of the respondents were in quarantine ((12 (10%) home and 5(4.2%) COVID-19 center Isolation)). Severity of illness were variable ranging from mild in15(12.5%) of cases to moderate in 2 (1.7%) cases (Table 2).

**Table 2:** Duration of Isolation (Quarantine).

| Weeks    | N (%)    |
|----------|----------|
| 1wk      | 8(6.7)   |
| 2wks     | 7(5.8)   |
| 3-4 4wks | 2(1.7)   |
| Total    | 17(14.2) |

Thirty three (27.5%) respondents were deployed to COVID-19 center and majority 24 (20.4%) of them were deployed for 2-4 weeks and three (2.5%) were deployed for > 8 weeks. Working hour was also affected by the pandemic in which nearly half 59(49.2%) of the respondents said there was decreased working hour while less than one third 24(20.0%) of the respondents said working hour remain unchanged.

There was challenges during patient evaluation and performing procedure due to different factors such as fogging of instruments, glasses and goggles in 38(31.7%) of the respondents and 13(10.8%) were fearing to evaluate patients due to close proximity and prolonged stay may increase risk of COVID-19 transmission.

In response to being asked about the part of examination interrupted during the pandemic, IOP measurement with non-contact tonometer 55(45.8%) and direct ophthalmoscope 8 (6.7%) evaluation were interrupted due to increased risk of COVID-19 transmission.

All respondents rate the impact of the pandemic on major ophthalmology services by 5-point Likert scale ranging from 1 (no impact) to 5 (very severe impact) and almost half of them reported that the pandemic had moderate impact on outpatient flow, quality of service and outreach cataract campaign (Table 3).

**Table 3:** Impact of COVID-19 pandemic on major eye care services at selected public hospitals, A.A, Central Ethiopia.

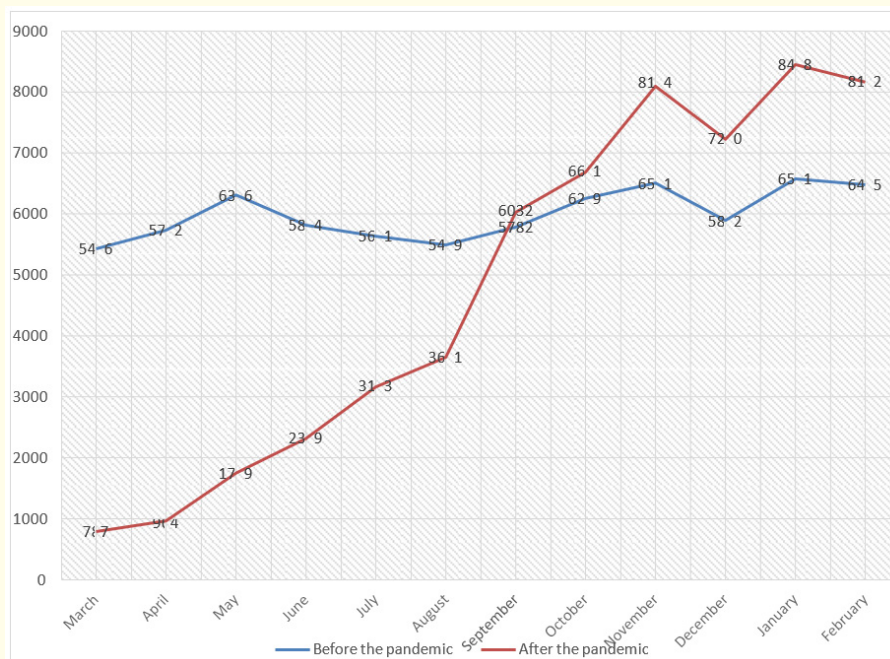
| Degree of impact | Out patient flow N (%) | Quality of service N (%) | Outreach cataractsurgery service (%) |
|------------------|------------------------|--------------------------|--------------------------------------|
| NO Impact        | 14(11.70)              | 9(7.5)                   | 9(7.5)                               |
| Mild impact      | 42(35.0)               | 31(35.0)                 | 31(25.8)                             |
| Moderate Impact  | 49(40.8)               | 51(42.5)                 | 50(41.7))                            |
| Sever Impact     | 11(9.2)                | 22(18.3))                | 24(20.0)                             |
| maximum Impact   | 4 (3.3)                | 7(5.83)                  | 6(5.0)                               |
| Total            | 120(100)               | 120(100)                 | 120(100)                             |

A comparison of major clinical services 12 months in the pre-COVID 19 and post -COVID19 eras evaluated and summarized in line charts.

A total of 71,446 comprehensive outpatient visit was seen within 12 month in the pre- COVID-19 era in those selected public hospital compared with 57,466 patients seen after the COVID 1-19 pandemic which decreased by 20% compared to the pre COVID-19 era. The mean number of outpatient visit per month during

the pandemic was 4776(SD 100) compared to 5989 (SD 124) per month before the pandemic.

Comprehensive outpatient visit significantly reduced during the first 6 month of the COVID-19 era. An average of 5733 patients/month was seen during the pre- COVID-19 era versus 2105 patients per month after the pandemic in which outpatient flow almost reduced by half during the first 6 month of the pandemic (Chart 1).



**Chart 1:** Comprehensive outpatient visit at selected public hospitals in A.A, Central Ethiopia within 1year before and after the COVID -19 era respectively (March 2019 to February 2020 G.C VS March 2020 to February 2021 G.C).

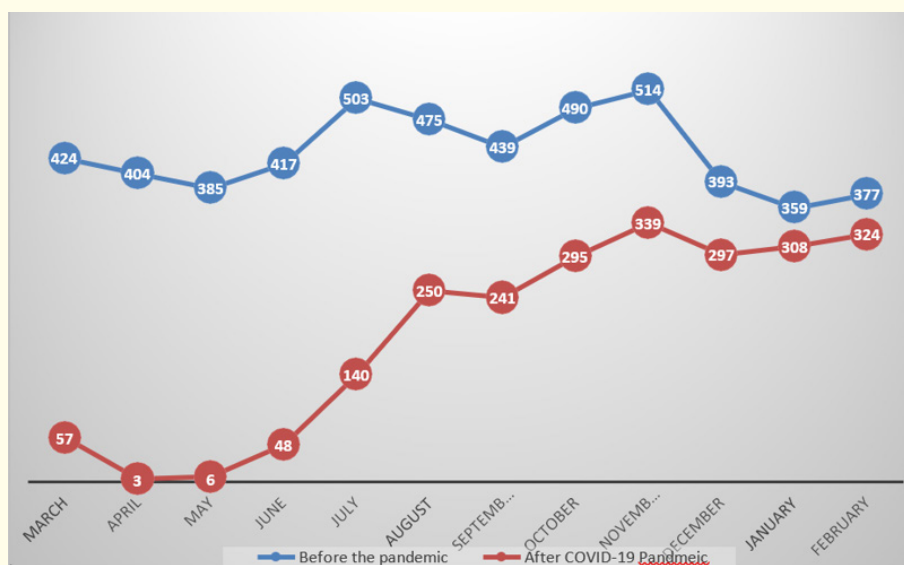
Total number of emergency visit within 12 months was reduced by 56% compared to the pre-COVID-19 pandemic era.

Total = 71,446/57,466; before the pandemic/after the COVID-19 pandemic respectively.

A total of 5170 major OR surgeries was done in all three centers within 12 months before the pandemic compared with 2200 procedures within 12 month of the COVID-19 pandemic which decreased

by 57.4% compared to the pre- COVID-19 era. The mean number of major surgeries per month during the pandemic 192(SD 83) compared to 431 (SD 110) cases per month before the pandemic.

Major OR services was largely affected within the first 4 months of the pandemic in which an average of 407 surgeries per month was done on pre- COVID-19 era compared to 29 patients per month of the same month which reduced by 93% (chart 2).



**Chart 2:** Major surgeries done at public hospitals in A.A, Central Ethiopia within 1 year before and after the COVID-19 era respectively (March 2019 to February 2020 G.C VS March 2020 to February 2021 G.C).

Total = 5170/ 2200; before the pandemic/after the COVID-19 pandemic respectively.

A total of number of minor procedures done within 12 months of COVID-19 era is reduced by nearly 50% compared to before the pandemic. The mean number of minor surgeries per month during the pandemic 78 (SD 45) compared with 167 (SD 76) cases per month before the pandemic.

Similarly, number of minor procedures was majorly reduced during the first 4 month of the pandemic in which 200 minor procedures was done per month before the pandemic compared with 10 patients per month within 4 month of the pandemic which reduced by 95% (chart 3).

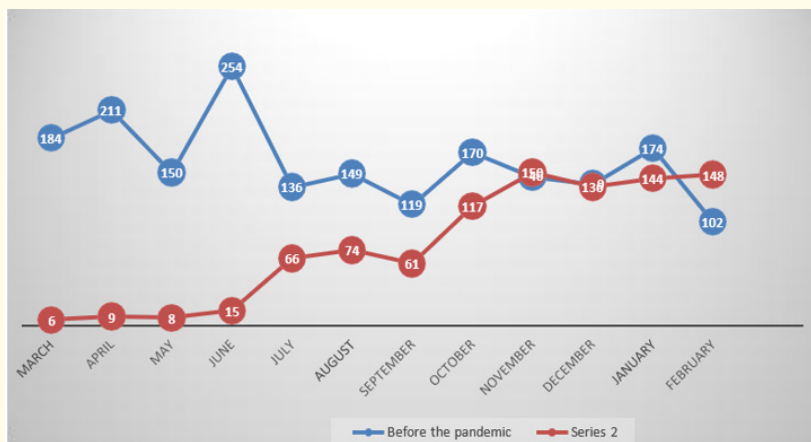
Total = 1831/930; before the pandemic/after the COVID-19 pandemic respectively.

### Impact on ophthalmology training

Nearly one third of the respondents 42 (27%) are using virtual conference to attend academic activities and 20(17%) of them are using Zoom.

In response to being asked, 45(37%) of the respondents rate the negative impact of the pandemic on academic training such as; extension of training periods 12(10%), extension of residency matching programs 7(6%), decreased elective procedures 22(18.3%) and decreased patient flow 4(3.3%) was reported.





**Chart 3:** Minor procedures done at public hospitals in A.A, Central Ethiopia within 1 year before and after the COVID -19 era respectively (March 2019 to February 2020 G.C VS March 2020 to February 2021 G.C).

More than one-third 42(35%) of the participants are concerned about their surgical training due to the pandemic and 24(20%) of them are concerned due to decreased cataract surgery.

### Discussion

The COVID-19 pandemic greatly affected the healthcare utilization service due to the lockdown and health facilities overwhelmed with COVID-19 patients. A WHO survey found that health services have been partially or completely disrupted in many countries globally but low-income countries are most affected [6].

In Ethiopia, most eye health units have suspended eye examinations for fear of spreading the COVID-19. Services are limited to managing injury-related eye emergencies. Elective ocular surgery has been suspended all over the country, and people presenting to eye units with bilateral blindness from cataract, for example, are being turned away, even if surgery would improve vision [16].

The COVID-19 pandemic has caused an unprecedented disruption in medical education and healthcare system worldwide [26].

The aim of this study was to identify the impact of the COVID-19 pandemic on ophthalmology services and postgraduate (residency) training in the ophthalmology specialty.

Darren Shujeng Ting, *et al.* carried out a study on the impact of COVID-19 pandemic on ophthalmology services in Queen’s Medical Centre, UK (on June 2020) showed that there was 63% and 67% reduction in the outpatient and surgical activities, respectively

compared to the same month before COVID-19 [20].

On this study, comprehensive outpatient visit within 12 month after the pandemic decreased by 20% compared to the pre-COVID-19 era. However, outpatient visit significantly dropped especially during the first 6 month of the COVID-19 era, which reduced by 50% nearly equal with the above study due to the lock down.

Major and minor surgeries was similarly reduced by 57.4% and 50% within 12 month period compared to the pre-COVID-19 era and the first 4 months was largely reduced by 93% and 95% compared to the same month respectively. This study almost similar with the study done in Egypt that ophthalmic surgeries reduced by 80%–100% [23].

Gedik, *et al.* carried out a study on the effect of the stay-at-home Policy on Ophthalmology outpatient clinic applications during the Covid-19 Pandemic at Turkey similarly detected a reduction of 56% in the number of patients visited to the ophthalmology clinic in the pandemic period compared to the non-pandemic period [21].

Outpatient emergency visits were less frequent during the COVID – 19 pandemic as compared to before COVID 19. A comparative study on Ophthalmic emergency-room visits during the Covid-19 pandemic at Meir Medical Center in Israel, found that the number of OER visits during the COVID – 19 pandemic was reduced by 43% as compared to the same month. Moon, *et al.* also found a 32% decrease in the total volume of OER visits in 2020 compared to prior years [24,25].

In this study, number of emergency visit was reduced by 36% compared to the same month and nearly similar with study done on Israel.

In general, the pandemic negatively affected eye care services and training. In this study, 45 (37%) of respondents reported a negative impact on ophthalmology academic training.

Rohit C Khanna, *et al.* (April 15 to April 19, 2020) done study on Psychological impact of COVID-19 on ophthalmologists-in-training and practicing ophthalmologists in India, showed that 52.8% felt that COVID-19 would impact on their training or professional work and 32.6% had some degree of depression [30] which is almost similar with this study.

In this study more than two third of the respondents reported that there was some psychological impact due to the pandemic in their professional life. Only 35% of respondents were getting adequate PPE supply as preventive measures for COVID-19, which will have impact on their health and service delivery. Only 50 (41.6%) of the respondents took complete dose of COVID-19 vaccine and 17 (14.2%) of the respondents were COVID-19 positive which will have some impact on their health, profession and clinical service.

Clinical service academic training also compromised due to the quarantine. On this study Less than one third (17 (14.2%) of the respondents were in quarantine (both home and COVID-19 center Isolation) in which eight (6.7%) for 1 week, 7 (5.8%) for 2 weeks and two (1.7%) for 3-4 weeks.

Some part of patient evaluation was affected during the pandemic. In this study more than half 63 (52.5%) of the respondents reported as some part of patient examination such as IOP measurement with non-contact tonometer 55 (45.8%) and 8 (6.7%) direct ophthalmoscope evaluation were interrupted due to increased risk of COVID-19 transmission.

A study done on impact of COVID-19 on ophthalmic specialist training in the United Kingdom on June 2020 showed that, 39% of the trainees were redeployed to specialties outside of ophthalmology, with 77% concerned about the impact of redeployment on training [28].

On the same study cataract surgery is their biggest concern (80%). The pandemic also result in postponement of The Royal College of Ophthalmologists postgraduate examinations [28].

In this study almost more than one-third 33 (27.5%) of the professionals were deployed to COVID-19 center and majority i.e. 24 (20.4%) of them were deployed for 2-4 weeks which compromised their training and ophthalmology clinical service.

Descriptive survey-based study done by Nisa SILVA, *et al.* (2020) on impact of the COVID-19 Pandemic on ophthalmology residency training in Portugal by Nisa SILVA, *et al.* (2020) showed that the COVID-19 pandemic has significantly affected the training of ophthalmology residents nationwide. Most Participants highly agreed with the extension of the residency program (80%) in order to make up for training disruption [29].

In this study more than one third of the participants 45 (37.4) rate the negative impact of COVID-19 on academic training such as extension of training periods by 1-2 months 12 (10%), extension of residency matching programs 7 (5, 8%), decreased elective procedures 22 (18.3%) and decreased patient flow 4 (3, 3%).

In this study more than one-third 42 (35%) of the participants are concerned about their surgical training due to the pandemic and 24 (20%) of them are concerned due to decreased cataract surgery. Few academic activities were continued with virtual conference. nearly one third of the respondents 42 (26.7%) were using virtual conference to attend academic activities and 20 (16.7%) of them are using Zoom.

## Conclusion

The pandemic disrupted most aspects of major ophthalmology services and made eye care services delivery challenging.

The COVID-19 pandemic has significantly affected the ophthalmology academic training.

## Recommendation

The adoption of alternative means of learning such as virtual class form may be helpful in improving theoretical knowledge.

Surgical skill for residents can be augmented with wet lab training.

Incorporation of adequate PPE and taking complete dose of COVID-19 vaccines may be helpful for the health professional to stay safe and to deliver eye care service.

## Acknowledgment

I would like to thank SPHMMC for giving me the opportunity to conduct this study. My deepest gratitude goes to my advisors Dr. Mandefro Sintayehu, Dr. Yemisirach Jimma and Mr. Tariku Shimelis for their preserved support to modify and correct the title of the study and develop the proposal and research paper.

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