
ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE SCHOOL OF MEDICINE

DEPARTMENT OF ANESTHESIOLOGY, RESEARCH THESIS

# Assessment of Knowledge, attitude and practice of Residents in using face mask for prevention of spread of novel corona virus at Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia".

By – Dr. Dagem Tsegaye(MD, Final Year Anesthesiology Resident)

Addis Ababa, Ethiopia
December , 2020

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**A Research Thesis To Be Submitted To Addis Ababa University School Of Medicine,Department Of Anesthesiology In Partial Fulfillment Of The Requirement For Specialty Certificate In Anesthesiology .**

## APPROVED BY THE BOARD OF EXAMINATION

The thesis here, entitled "Assessment of Knowledge, attitude and practice of Residents in using face mask for prevention of spread of novel corona virus at Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia". is accepted in its present form by the board of examiners as partial fulfillment of the requirement for specialty certificate in Anesthesiology Critical Care And Pain Medicine.

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## STATEMENT OF THE AUTHOR

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every serious effort has been made to avoid any plagiarism in the preparation of this thesis. This thesis is submitted in partial fulfillment of the requirement for speciality of anaesthesiology degree to AAU. I would like to declare that this thesis has not been submitted to any other institution anywhere for the award of any academic degree, diploma or certificate.

Name: _____ Signature: _____

Date: _____

Program: Speciality of Anaesthesiology, AAU

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## ACRONYMS AND ABBREVIATIONS

WHO- World Health Organization

PPE- Personal Protective Equipment

CDC- Center for Disease Control and prevention

SARA-CoV-2- Severe Acute Respiratory Coronavirus 2

COVID-19- Coronavirus disease 2019

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## ABSTRACT

### Introduction

Coronavirus is the second pandemic emerged in 21st century following influenza A H1N1 which occurred back in 2009. The World Health Organization (WHO) and Center for Disease Control and Prevention (CDC) both recommended to use face mask for the prevention of infection in the health facility. This kind of strategies are very important for resource limited countries with a very higher case incidence in order to keep safe their medical staff from COVID 19 infection. The use of face mask as way of infection prevention to work, proper use is very important which highly depend on the knowledge and attitude towards it of how to use it.

### Materials and Methods

We used facility based cross- sectional study design. The study area is Tikur Anbessa Specialized Hospital. The data was collected using structured self-administered questionnaires. The data collection tool was adopted from previous study, and modified for this study. The data was entered to Epi-data V 5 for cleaning and was imported to SPSS V 25 for analysis. Descriptive analysis and association for the participants was done. The study population for this study were residents from Anesthesiology, Internal medicine, Obstetric and gynecology and General Surgery residents working at TAH. The final sample size for this study is 151. Ethical clearance and support was obtained from Department of Anesthesiology Institution of Review Board.

### Results

There are four major findings of the study. The overall good knowledge of respondents was found to be **71.5%,** Positive attitude was found to be **83.4 %** and good practice was found to be **39.1%.** The overall practice of facemask was found to be **poor**. The study also showed very strong correlation between Good level knowledge and attitude. Internal medicine and Obstetric and Gynecology residents were found to have good knowledge compared to their compatriots. In addition, younger residents and residents with higher experience were found to have good knowledge.

### Conclusion and recommendation

The Knowledge and attitude of Residents regarding the use of surgical face masks were found to be good but practice was found to be poor. This shows more awareness is required about several aspects such as the types of masks, the duration of using masks and the proper disposal of the masks.

# 1. INTRODUCTION

## 1.1. Background

Coronavirus which is first occurred in, Wuhan Hubei Province of china, in December 2019 is caused by a severe acute respiratory coronavirus 2 (SARA-CoV-2) (1-3). It is a closely related to bat SARS coronavirus 1 and is the second pandemic emerged in 21st century following influenza A H1N1 which occurred back in 2009 (2). The virus mainly spreads through droplets produced during an infected person cough or sneezes and also when one touches contaminated surfaces and then touches their mouth, nose, eyes, or faces (1, 4, 5).

Coronavirus disease 2019 (COVID-19) was first declared as a global pandemic by World Health Organization (WHO) on March 11, 2020 after 3 days which Wuhan, Hubei Province of China on 31 December 2019 first officially announced patients with community acquired pneumonia (2, 3, 6).

Because of close contact with confirmed case of COVID 19 health care workers have higher chance of getting severe infection and also face higher risk of death (1, 3).

To minimize the exposure of health care workers to COVID 19 infection using telemedicine as one way of giving medical care for suspected COVID 19 cases, using plastic barriers like glasses or plastic windows and avoiding for the health care workers to enter into COVID 19 patient's room unless they are involved in direct care of the patients (4). Many countries are now putting a strategy of using face mask as way of minimizing the risk of infection for health workers and community in addition to frequent hand washing. This provides physical barrier between the wearer and contaminated immediate environment (1, 3).

The World Health Organization (WHO) and Center for Disease Control and Prevention (CDC) both recommended to use face mask for the prevention of infection in the health facility. This kind of strategies are very important for resource limited countries with a very higher case incidence in order to keep safe their medical staff from COVID19 infection (1, 7). The use of face mask as way of infection prevention to work, proper use is very important which highly depend on the knowledge and attitude towards it (1). This study will provide evidence on the knowledge, attitude and practice of Residents at Tikur Anbessa Specialized Hospital so as to help to design appropriate strategies in order to increase the face mask use effectively for the prevention of infections.

## 1.2. Statement of the problem

Reports showed that there are thousands of health care workers becoming infected with COVID 19 with higher death rates. In addition inaccurate use and disposal of face mask leads to increasing the rate of transmission (3). Evidences also showed that health care workers have inadequate knowledge regarding the proper use and disposal of surgical mask (3).

In the health care setting the recommended prevention mechanisms are using personal protective equipment (PPE). For health care workers, PPE suggested by the guideline are masks and respirators for the prevention of pathogens that spreads through respiratory droplets and aerosol routes (8). The aim of using face mask as putted by the guideline is to prevent the wearer from infection spread through body fluids or sprayed, where the respirators keep safe the wearer from confirmed or possible respiratory infections (8). Surgical masks and N95 respirators are the two most prevalent RPE used in hospitals. Surgical masks protect HCWs from inhalation of infected droplets and microorganisms transmitted through the mouth and nose, whereas N95 respirators protect HCWs against airborne pollutants. N95 respirators provide better protection than surgical masks, World Health Organization, however, they can cause breathing resistance, heat, moisture and discomfort for users. Numerous studies have shown that HCWs generally comply poorly with RPE regulations. Reasons for HCWs not using RPE includes not having RPE readily available or not knowing that a patient has transmittable disease. Other factors that appear to influence RPE practices are individual's perceptions and knowledge (9).

For this recommendation to be effective health care professionals should have the knowledge on how to properly wear and dispose the face mask they used. Poor knowledge on the preventive capacity of face mask is one of the reason for poor quality of mask and in adequacy of masks. (8). In addition low knowledge on the recommended procedures of wearing and disposing face mask increases transmission among health care professionals or the community (3). To minimize the risk of infection transmission among health care providers they should follow the recommended procedures by the guidelines that suggests mainly hand washing and wearing face mask (3). This study will assess the knowledge, attitude and practice of Residents at Tikur Anbessa Specialized Hospital so as to generate evidence that will be an input for designing better interventional strategies.

## 1.3. Significance of the study

There are very limited studies in our country concerning the use face mask among health care workers. With the growing number of infection and death in both community and health care workers, it is crucial to see the knowledge, attitude and practice of using face mask among Residents in order the necessary steps and measures to protect and help those professionals. This study will provide evidence on the knowledge, attitude and practice of Residents working at Black lion specialized hospital for the concerned bodies that eventually help them put appropriate solutions in place.

## 2. LITERATURE REVIEW

A study revealed that 13.8% health care providers tend to remove their face mask while talking to the patient, 20.2% reused the mask, and 44.9% correctly used the yellow-coded bag for disposal of the face mask. Also most of the participants 93.9% had practice of wearing masks in clinics and 94.6% of the participants wear masks in hospital premises. When confidence level of the participants were assessed 88.5% of them were found to be confident enough about their knowledge and practice of correctly wearing face masks. Finally the knowledge of participants were classified as were good in 138 (35.2%), moderate in 178 (45.4%), and poor in 76 (19.3%) (1).

When the knowledge was assessed, 56.4% knew the correct way of wearing a surgical mask, 68.9% knew that there are three layers in a surgical mask, and 53% knew how to identify the correct filter media barrier. Around 64.8% of participants knew the correct efficiency of masks that can actually protect against COVID-19, whereas 75.6% were aware of the maximum duration of wearing a face mask. When the study participants were asked about the extent to which surgical mask should cover, 74.7% answered correctly and 92% correctly reported the purpose of the metal strip (1). "White side facing in" is the correct way of using surgical face mask, 86.21% of the health care workers answered the question correctly. The surgical mask contains three layers, more than 86% of the respondents said that it includes 3 layers, 6.9% of them said that it contains four layers and 6.9% said it contains 2 layers. About 79.31% of the health care workers said that wearing a surgical mask protect from COVID-19 spreading. Middle layer of the mask acts as a filter media barrier, 65.52% of the respondents answered the question correctly. Regarding the types of masks, 95% BFE and PFE is the mask type that actually protect against COVID-19, about 65.52% of health care providers responded correctly. A physician can wear a surgical mask for 8 hours, only 51.72% answered the question correctly and about 41.38% said that it can be used only for 4 hours. Surgical mask should cover nose, mouth, and chin, 86.21% of the respondents answered correctly. The main purpose of the metal strip on a surgical mask is to fit on the nose, as reported by 100% of the respondents (3). The cloth facial mask is not as effective as a regular surgical facial mask, 82.76% of the health care workers (3).

# 3. OBEJECTIVE

## 3.1. General Objective

To assess the knowledge, attitude and practice of Residents at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2020.

## 3.2. Specific Objectives

3.2.1. To assess the knowledge of Residents at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2020.

3.2.2. To assess the attitude of Residents at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2020.

3.2.3. To assess the practice ofRresidents at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2020.

# 4. MATERIALS AND METHODS

## 4.1. Study design

Facility based cross sectional study design was employed among Residents to assess knowledge, attitude and practice in using face mask.

## 4.2. Study area and period

The study was conducted at Tikur Anbessa Specialized Hospital which is the highest referral facility in the country. Tikur Anbessa Specialized Hospital was first build in 1992. The hospital is one of the sites for both clinical and preclinical training in the country. The various departments, faculties and residents under specialty training in the school of medicine provide medical care in the hospital. The study will be conducted from September to November 2020.

## 4.3. Population

### 4.3.1. Source population

The source population for this study was all Residents who are working at Tikur Anbessa Specialized Hospital.

### 4.3.2. Study population

The study population for this study were residents from Anesthesiology,Internal medicine, Obstetric and Gynecology and General. surgery departments working at Tikur Anbessa Specialty Hospital.The reason these specific departments choosen was because of their exposure more on operation theatres ,ICUs and Covid Isolation rooms, outpatient and Emergency departments, labour wards and general wards.

## 4.4 Inclusion and exclusion criteria

### 4.4.1 Inclusion criteria

- ✓ Residents from Internal medicine, Anaesthesiology, Obstetric and Gynecology and General surgery departments.
- ✓ Residents who are willing to participate in the study

### 4.4.2 Exclusion criteria

- ✓ Residents on their month off
- ✓ Residents who are practicing at public hospitals other than tikuranbessa hospital.

## 4.5. Sample size determination

We used the prevalence of correct use of face mask in health care setting found in a study done at Prince Sattam bin Abdulaziz University 86.21% (3). The calculated minimum sample size for this study using single proportion population formula. We used 95% confidence level and 5% margin of error.

$$n = \frac{Z\,(\alpha/2)^2 P\,(1-P)}{d^2}$$

p = 86.21%, prevalence of correct use of face mask **(3)**

z = 1.96,

d = 0.05, the probability of detecting minimum of 5% difference committed by chance.

$N=1.96^2(0.8621)\,(0.1379)/\,(0.05)^2$

The final sample size for this study is 182. But since the population is less than 10,000 we used population correction formula the final sample size becomes 151.

## 4.6. Sampling procedure

For this study the study participants were residents from Anesthesiology, internal medicine, Obstetric and Gynecology and General surgery departments currently working as a medical care provider at Tikur Anbessa specialized Hospital. Responders were stratified according to the number of residents in each department.

## 4.7. Data collection procedure

The data was collected using self-administered close ended questionnaires. The questionnaire was adopted from a previous study (1) and modified for this study. The data collectors were trained before data collection.

### 4.8 Variables

4.8.1 Dependent variables

- Knowledge of responders about proper use of surgical facemask
- Attitude of responders towards proper use of surgical facemask
- Practice of responders towards proper use of surgical facemask

4.8.2 Independent Variables

- Age of responders
- Sex of responders
- Year of experience of responders
- Department of responders

## 4.9. Data quality assurance

The data collectors were trained before data collection and there was daily meeting during data collection to clear up if there is any ambiguity during data collection. Data was cleaned on daily basis.

## 4.10. Data analysis procedure

The data collected was entered into Epi- data for data clearance and then was imported to SPSS V25software for analysis. Descriptive analysis was done for the participants. The result was presented using frequency, table, percentage and a logistic regression model was used to measure the association between the variables.

## 4.11. Ethical issue

Ethical clearance and support was obtained from Department of Anesthesiology Institution of Review Board and was submitted to Tikur Anbessa Specialized Hospital officials to conduct the study. Written informed consent was obtained from respondents after explanation is given on the objective, procedure, potential risks and benefits of participating in the study and the right to withdraw from the study at any time throughout their interview.

The participants were informed that there will be no direct benefit in participating in this study.

Study participants were assured their response confidentiality by removing personal identifications instead using codes and not sharing their information to anyone other than the study team.

### 4.12 Operational definition

- **Good level Knowledge**: respondents who are able to answer **> mean** of knowledge questions correctly were regarded as having good level knowledge.
- **Poor level knowledge:** respondents who correctly respond to < mean of knowledge questions were regarded as having poor level knowledge.
- **Positive attitude:** those who are able to answer **> mean** of the attitude questions correctly were regarded as having positive attitude.
- **Negative attitude:** those who are able to answer < mean of attitude questions were regarded as having negative attitude.
- **Good practice:** those who are able to answer **>mean of** practice questions correctly.
- **Poor practice;** those who answered **<mean of** practice questions.

### 4.13 Result dissemination plan

The study result will be submitted to Addis Ababa University School of medicine and be presented to the health science community and disseminated to the concerned bodies. Finally the result will be published on peer reviewed scientific journal.

# 5. RESULTS

## 5.1 Introduction

This chapter presents the findings of the study and discussions as per the objectives. The relevent socio-demographic factors, Prevalence of health care workers with good level of Knowledge, positive attitude and good practice in using face mask for prevention of spread of novel corona virus have been described..

## 5.2 Demographic characteristics of respondents

The study population comprised of resident physicians from Internal medicine, General surgery, Obstetric and Gynecology and Anaesthesiology departments. A total of 151 respondents participated in the study. Data analysis was done for all the respondents (i.e 100 % responder rate).

Age of responders is 62.3 % (N= 94) for the age group 20-29 while, it is 37.7 % (N=57) for the age group 30-39. Regarding the gender 24.5% (N=37) of the responders are female, while 75.5% (N=114) are males. The study also emphasize on the proportion of departments of responders and found out 13.9% (N=21) were Anaesthesiology residents, 19.2 % (N=29) Internal medicine residents, 39.1 % (N=59) General surgery and Obstetric and Gynecology 27.8 % (N= 42). In an attempt to correlate the KAP of responders with prior years of experience the later was also assessed and 33.8 % of responders were found to have 1-3 years of experience while 66.2 % of the responders were found to have >3 years of experience. The following socio- demographic table will summarize the result.

**Table 1: Socio-Demographic characteristics of the study participants in Addis Ababa, Ethiopia (N=151)**

| Variable | Category | Frequency in No | Percentage % |
|---|---|---|---|
| **Age** | 20-29 | 94 | 62.3 % |
| | 30-39 | 57 | 37.7 % |
| **Sex** | Female | 37 | 24.5 % |
| | Male | 114 | 75.5 % |
| **Department of responders** | Anaesthesia | 21 | 13.9 % |
| | General surgery | 59 | 39.1 % |
| | Internal medicine | 29 | 19.2 % |
| | Ob/Gyn | 42 | 27.8 % |
| **Years of experience** | 1-2 Years | 51 | 33.8 % |
| | 3-10 Years | 100 | 66.2 % |

### 5.3 Knowledge of Respondents

Respondents were asked nine knowledge based question. The first of which was to state the side of the face mask facing in or out. A significant portion of responders i.e 94.7 % (N= 143) responded correctly. Subsequently, residents were also asked to state the number of layers in a surgical face mask and larger portion of them (N=105, 69.5 %) responded correctly while (N=46, 30.4%) responded incorrectly stating either it has four or two layers.

Residents were asked to state if wearing a surgical mask protect from COVID-19 spreading, and 90.7 % (N=137) responded True . The next significant question was for residents to state type of masks actually protect against COVID-19, 51.7% (N= 78) stated correctly saying 95% BFE & PFE but significant portion of responders (42.4 %, N=64) said 99%BFE & PFE would protect against covid-19.

Respondents were asked to state which layer of the mask acts as a filter media barrier? and 58.9 % (N=89) Responded correctly saying the middle layer, while 33.1% (N=50) responded the first layer is used as filter medium Number of hours physicians should wear surgical face mask was also assessed 53% (N=80) responded for 8 hours which is the correct answer while 39.1% (N=59) and 7.9% (N=12) responded 4 hours and 2 hours respectively.

Extent of face that should be covered with surgical facemask was also assessed and a staggering 98.7 % (N= 149) responded correctly saying nose, mouth and chin should be covered .The next knowledge based question assessed what the main purpose of the metal strip on a surgical mask; 96.7% (N=146) responded correctly saying to fit the nose while the rest did not. The final question was for the residents to state if the cloth facial mask is as effective as a regular surgical facial mask? 85.4% (N=129) responded True while 14.6% (N=22) False. The following table summarizes the knowledge of responders regarding correct use of facemask.

**Table 2: Knowledge of the study participants in Addis Ababa, Ethiopia (N=151)**

| No. | Knowledge based question | Category | Response in No | Response in Percentage |
|---|---|---|---|---|
| 1 | Correct way of using surgical face mask | 1. White side facing in | 143 | 94.7% |
| | | 2. White side facing out | 8 | 5.3% |
| 2 | Layers surgical mask contains | 1. Two | 44 | 29.1% |
| | | 2. Three | 105 | 69.5% |
| | | 3. Four | 2 | 1.3% |
| 3 | Surgical mask protect from COVID-19 spreading | 1. True | 137 | 90.7% |
| | | 2. False | 14 | 9.3% |
| 4 | Type of masks actually protect against COVID-19 | 1. 91% BFE and PFE* | 1 | 0.7% |
| | | 2. 95% BFE and PFE | 78 | 51.7% |
| | | 3. 97% BFE and PFE | 8 | 5.3% |
| | | 4. 99% BFE and PFE | 64 | 42.4% |
| 5 | Layer of the mask acts as a filter media barrier | 1. First layer | 50 | 33.1% |
| | | 2. Middle layer | 89 | 58.9% |
| | | 3. Last layer | 12 | 7.9% |
| 6 | For how many hours a physician can wear a surgical mask? | 1. 1 hours | 0 | 0 |
| | | 2. 2 hours | 12 | 7.9% |
| | | 3. 4 hours | 59 | 39.1% |
| | | 4. 8 hours | 80 | 53% |
| 7 | To what extent did Surgical mask should cover? | 1. Nose only | 0 | 0 |
| | | 2. Nose and mouth | 2 | 1.3% |

| | | | | |
|---|---|---|---|---|
| | | 3. Nose, mouth and chin | 149 | 98.7% |
| 8 | What is the main purpose of the metal strip on a surgical mask? | 1. To fit on the nose | 146 | 96.7% |
| | | 2. To fit on the chin | 4 | 2.6% |
| | | 3. No purpose | 1 | 0.7% |
| 9 | Is the cloth facial mask as effective as a regular surgical facial mask? | 1. True | 22 | 14.6% |
| | | 2. False | 129 | 85.4% |

***As per our operational definition respondents that answer >Mean of the knowledge based question (i.e 7 questions) were labeled "Good level knowledge" while those that answer below the mean were labeled "poor level knowledge". The results revealed 71.5% (N=108) of the responders to have Good level knowledge towards proper use of facemask & 28.5% (N=43) of the responders were found to have poor level knowledge.***

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Practicefinal | 151 | 2 | 6 | 4.24 | .943 |
| Attitudefinal | 151 | 0 | 5 | 2.91 | .711 |
| Knowledge | 151 | 3 | 9 | 6.99 | 1.180 |
| Valid N (listwise) | 151 | | | | |

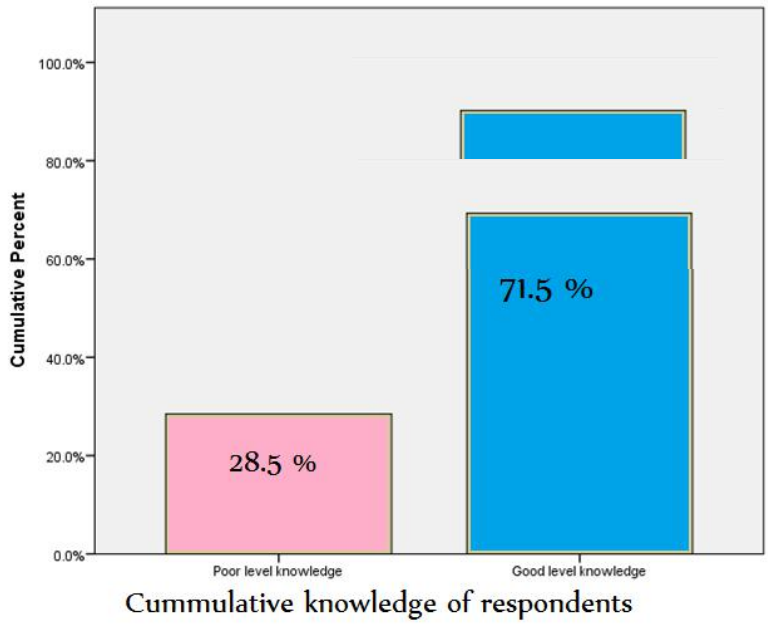


**Fig 1 : Bar chart depicting cumulative knowledge of responders in A.A, Ethiopia 2020 G.C (N=151)**

## 5.4 Attitude of respondents

Five questions were conducted for respondents to assess their attitude towards proper utilization of surgical facemask. Initially responders were asked if they are confident enough to know the correct steps of wearing a face mask. The majority 85.4% (N=129) responded they are confident. Consequently, responders were asked their attitude towards wearing face mask, if it can protect them from getting COVID 19 infection. 36.4% (N=55) strongly agreed and 57% (N=86) agreed. Responders were asked to state if wearing face mask can protect people around them and44.4% (N=67) strongly agreed, while 51 % (N=77) Agreed . Consequently, responders were asked only people with respiratory symptoms should wear face mask; 37.1% (N=56) Disagreed and a significant majority i.e 56.3% (N=85) Strongly disagree. Finally, responders were asked if wearing face mask can replace other preventive ways of COVID 19 infection, a significant majority 51% (N=77) strongly agreed and 38.4% (N=58) disagree .The following table will summarize the attitude of responders.

**Table 3: Attitude of the study participants in Addis Ababa, Ethiopia (N=151)**

| No. | Attitude based question | Category | Response in No | Response in Percentage |
|---|---|---|---|---|
| 1 | confident enough to know the correct steps of wearing a face mask | 1. Yes | 129 | 85.4% |
| | | 2. No | 22 | 14.6% |
| 2 | Wearing face mask can protect you from getting COVID 19 infection | 1. Strongly agree | 55 | 36.4% |
| | | 2. Agree | 86 | 57% |
| | | 3. Strongly Disagree | 8 | 5.3% |
| | | 4. Disagree | 2 | 1.3% |
| 3 | Wearing face mask can protect people around you from COVID 19 infection | 1. Strongly agree | 67 | 44.4% |
| | | 2. Agree | 77 | 51% |
| | | 3. Strongly Disagree | 5 | 3.3% |
| | | 4. Disagree | 2 | 1.3% |
| 4 | Only people with respiratory symptoms should wear face mask | 1. Strongly agree | 6 | 4% |
| | | 2. Agree | 4 | 2.6% |
| | | 3. Strongly Disagree | 56 | 37.1% |
| | | 4. Disagree | 85 | 56.3% |
| 5 | Wearing face mask can replace other preventive ways of COVID 19 infection | 1. Strongly agree | 1 | 0.7% |
| | | 2. Agree | 15 | 9.9% |
| | | 3. Strongly Disagree | 58 | 38.4% |
| | | 4. Disagree | 77 | 51% |

***As per our operational definition respondents that answer >mean of the attitude based question were labeled "positive attitude" while those that answer below mean were labeled "Negative attitude (i.e mean of attitude= 2.91)". The results revealed a staggering 83.5% (N=126) of the responders to have positive attitude towards proper use of facemask & 16.5% (N=25) of the responders were found to have Negative attitude towards proper use of facemask.***

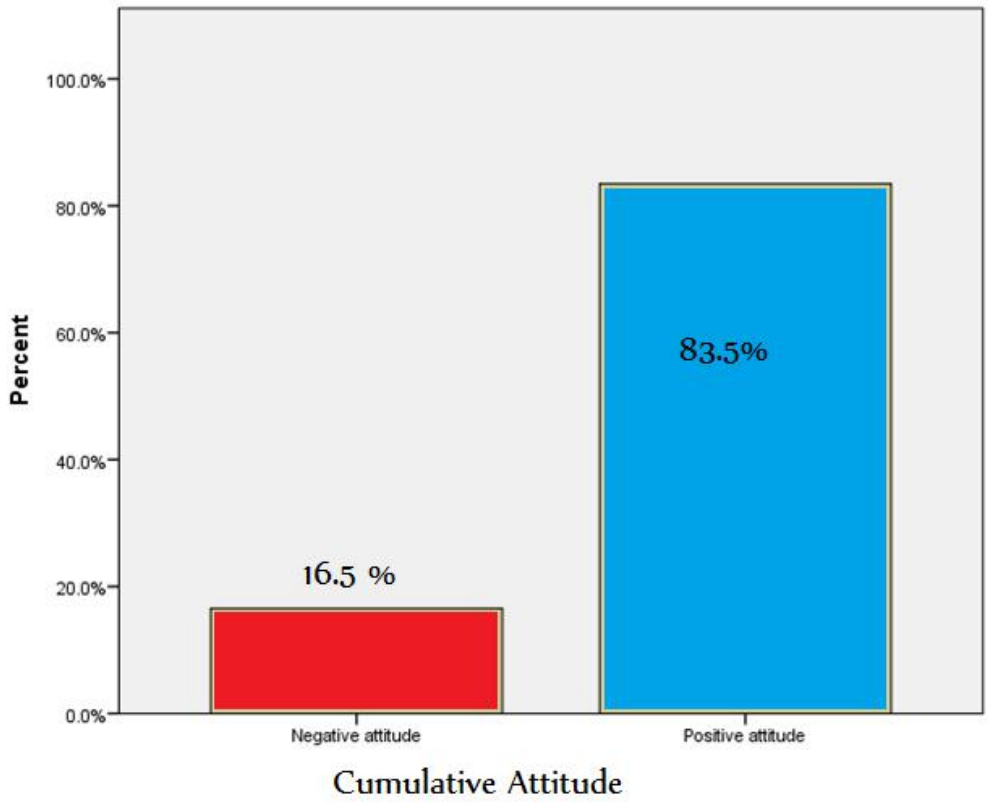


**Fig 2 : Bar chart depicting cumulative Attitude of responders in A.A, Ethiopia 2020 G.C (N=151)**

## 5.5 Practice of responders

Daily practice of surgical facemask was assessed. Primarily, if there is a need to talk to the patient, and if responders would remove your mask? Significant majority of the participants 98.7% (N=149) responded they don't remove their facemask. Subsequently, participants were asked if they remove facemask for later use. Interestingly 47% (n=71) responded they remove facemask for later use while 53% (N=80) responded they discard facemask after single usage.

Practice of respondents towards wearing facemask in public places to protect them against COVID-19 was assessed. 98% (N=148) responded they do while the rest responded they don't. In relation to the former, respondents were also asked if they use facemask in hospital premises to protect them against COVID-19, 98.7% (N=149) responded they do while the rest don't.

Considering proper disposal of facemask participants were asked which color-coded bag they use to dispose off their facemask. A significant majority of responders used yellow bag to dispose off their masks i.e 47% (N=71), and 32.5% (N=49), 16.6% (N=25), 4% (N=6) responded Red, Black and blue respectively.

Finally responders were asked if they have enough amount of facemask for daily use. 71.5% (N=108) of respondents said they don't receive enough amount of facemask for daily use while 28.5% (N=43) responded they receive enough facemask for daily use.

**Table 4: Practice of the study participants in Addis Ababa, Ethiopia (N=151)**

| No. | Practice based question | Category | Response in No | Response in Percentage |
|---|---|---|---|---|
| 1 | While talking to patients, will you remove your mask? | 1. Yes | 2 | 1.3% |
| | | 2. No | 149 | 98.7% |
| 2 | Reuse of facemask for later use if not sick | 1. Yes | 71 | 47% |
| | | 2. No | 80 | 53% |
| 3 | Do you wear a mask in public places to protect yourself against COVID-19? | 1. Yes | 148 | 98% |
| | | 2. No | 3 | 2% |
| 4 | Do you wear a mask in hospital premises to protect yourself against COVID-19? | 1. Yes | 149 | 98.7% |
| | | 2. No | 2 | 1.3% |
| 5 | In which color-coded bag you dispose of your mask? | 1. Black | 25 | 16.6% |
| | | 2. Blue | 6 | 4% |
| | | 3. Red | 49 | 32.5% |
| | | 4. Yellow | 71 | 47% |
| 6 | Do you have enough amount of face mask for your daily use? | 1. Yes | 43 | 28.5% |
| | | 2. No | 108 | 71.5% |

***As per our operational definition respondents that answer >mean of the practice based question were labeled "Good practice" while those that answer below mean were labeled "poor practice". The results revealed 39.1% (N=59) of the responders to have good practice towards proper use of facemask & 60.9% (N=92) of the responders were found to have poor practice towards proper use of facemask.***

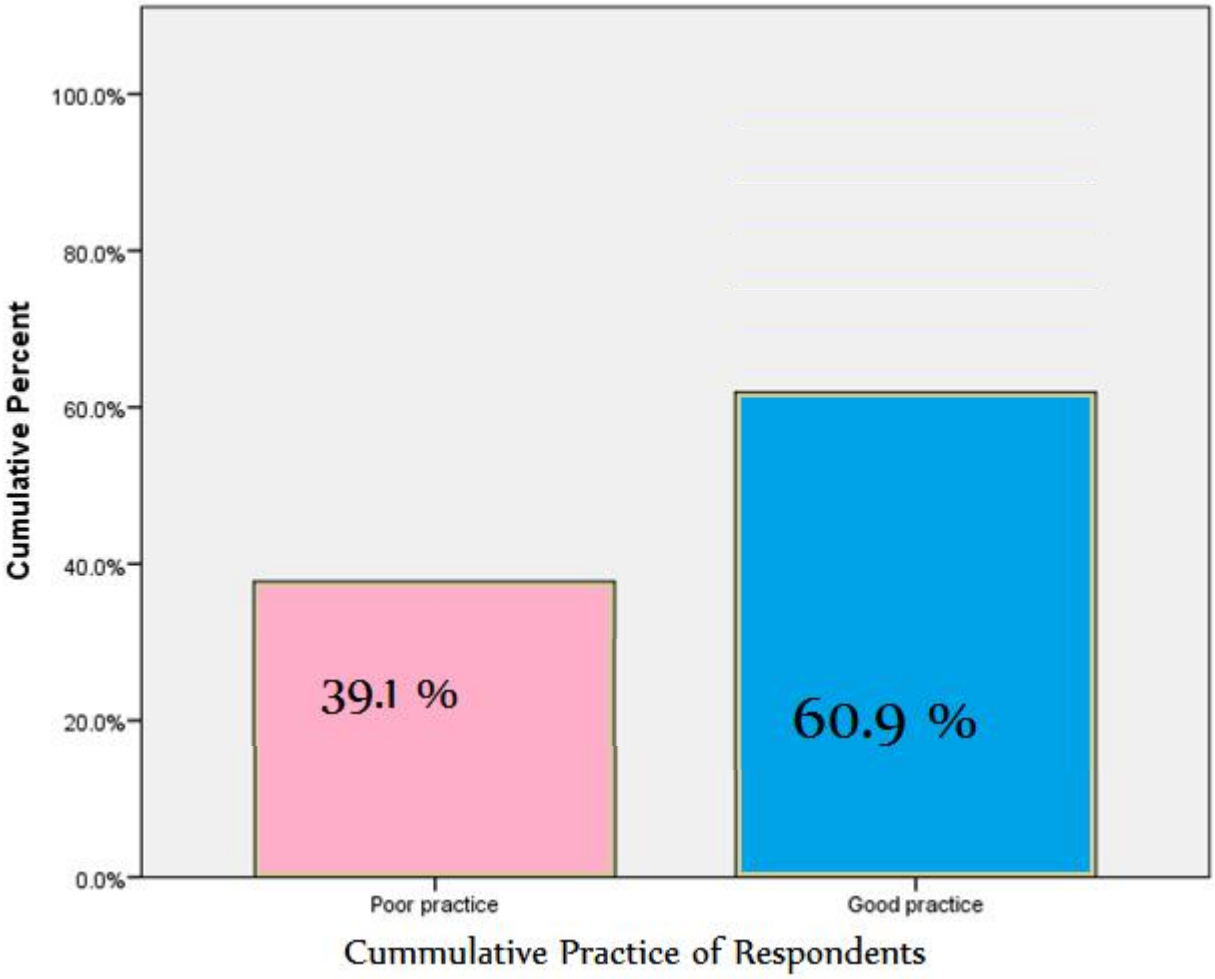


**Fig 3 : Bar chart depicting cumulative Practice of responders in A.A, Ethiopia 2020 G.C (N=151)**

### 5.5 Correlation study

A result obtained from Bivariate and Multivariate logistic regression showed that Attitude has positive correlations with Knowledge about Utilization of facemask.

Overall knowledge about proper use of surgical facemask as measured by the knowledge index (Participants were assumed to have good overall knowledge if they answer >mean of knowledge based questions) was the strongest factor associated with attitude of proper use of surgical facemask with. **The odds of responders with poor knowledge to have negative attitude was 4.605 times more than responders with good knowledge AOR CI=95% 4.605 (1.8-11.5).**.

Residents with higher year of experience was found to have positive attitude towards facemask use with **AOR CI=95% 4.322 (1.729-10.810)**

### 5.5.1 Correlation of Knowledge as a dependent variable with independent variables

Cumulative good knowledge (as reflected by those responders that answer above mean of knowledge base questions) was found to have significant correlation with younger age, departments(Internal medicine and Obstetric and Gynecology) and higher year of experience. younger respondents (age 20-30) were found to be 2.9 times more knowledgable than their older counterparts ***AOR CI=95% 2.929 (1.244-6.897).*** Internal medicine residents were found to be 7.39 and obstetric and Gynecology residents were found to be 3.953 times more knowledgeable than General surgery residents with; **AOR CI=95% 7.3 (1.83-29.734), AOR CI=95% AOR CI=95% 6.550 (1.496-10.447) respectively. But there was no statistically significant relationship between Anaesthesiology and General surgery residents. Residents with higher year of experience were found to have 73.4% more knowledge than their other counterparts** ; **AOR CI=95% 0.361 (0.151-0.862).**

**Table 5: Multinomial logistic regression analysis of knowledge with Other variables, (N=151) A.A, Ethiopia.**

| Variable | Characteristics | knowledge of residents | | COR (95% CI) | AOR (95% CI) |
|---|---|---|---|---|---|
| | | Good (>mean) 59 | Poor (<Mean) 92 | P- Value | P-Value |
| Age | 20-29 | 72 | 22 | 2.419 (1.076– 5.441) | 2.929 (1.244– 6.897) |
| | | | | .033 | .014** |
| | 30-39 | 36 | 21 | 1 | **reference** |
| Year of experiance | <2 years | 32 | 19 | .400 (.171– .936) | .361 (.151– .862) |
| | | | | .035 | .022** |
| | 3 years and above | 76 | 24 | 1 | **reference** |
| Occupation | General Surgery | 34 | 25 | 1 | **reference** |
| | Internal medicine residents | 26 | 3 | 5.6 (1.48-21.19) | 7.392 (1.838-29.734) |
| | | | | 0.011 | .005** |
| | Og/Gyn Residents | 33 | 9 | 3.597 (1.383-9.339) | 3.953 (1.496-10.447) |
| | | | | .009 | .006** |
| | Anaesthesia Residents | 15 | 6 | 3.029 (.922-9.948) | 3.052 (0.910-10.240) |
| | | | | .068 | .071 |

**5.5.2 Correlation of Attitude as a dependent variable with independent variables**

Cumulative Positive attitude was found to have significant correlation with higher year of experience. **Residents with higher years of experience were found to have 4.3 times more positive attitude than their other counterparts towards proper use of facemask** ; **AOR CI=95% 4.323 (1.729-10.81).**

**Table 6: Multinomial logistic regression analysis of Attitude with Other variables, (N=151) A.A, Ethiopia.**

| Variable | Characteristics | Attitude of residents | | COR (95% CI) | AOR (95% CI) |
|---|---|---|---|---|---|
| | | Positive (>mean) | Negative (<Mean) | P- Value | P-Value |
| **Age** | 20-29 | 81 | 13 | 2.358 (0.868– 6.410) | 2.102 (0.760– 5.814) |
| | | | | 0.093 | .153 |
| | 30-39 | 45 | 12 | 1 | **reference** |
| **Year of experiance** | <2 years | 35 | 16 | .168 (.062– .459) | 4.3 (1.7–10.8) |
| | | | | .001 | 0.001** |
| | 3 years and above | 91 | 9 | 1 | **reference** |
| **Occupation** | General Surgery | 48 | 11 | 1 | **reference** |
| | Internal medicine residents | 26 | 3 | 1.629 (0.386-6.879) | 1.296 (0.291-5.770) |
| | | | | 0.507 | 0.734 |
| | Og/Gyn Residents | 37 | 5 | 2.547 (0.755-8.588) | 2.466 (0.723-8.406) |
| | | | | 0.132 | 0.149 |
| | Anaesthesia Residents | 15 | 6 | 1.078 (0.295-3.938) | 1.100 (0.302-4.010) |
| | | | | 0.910 | 0.885 |
| **Knowledge of respondents** | Good level knowledge | 97 | 11 | 1 | Reference |
| | Poor level knowledge | 29 | 14 | 4.257 (1.745-10.387) | 4.605 (1.841-11.518) |
| | | | | 0.001 | 0.001** |
| 1= reference ** = p- value < 0.05 | | | | | |

**Table 7: Multinomial logistic regression analysis of Practice with Other variables, (N=151) A.A, Ethiopia.**

| Variable | Characteristics | Practice of residents | | COR (95% CI) | AOR (95% CI) |
|---|---|---|---|---|---|
| | | Good (>mean) 59 | Poor (<Mean) 92 | P- Value | P-Value |
| Knowledge | Poor | 15 | 28 | 0.922 (0.402 – 2.115) | 0.990 (0.425 – 2.304) |
| | | | | 0.848 | 0.981 |
| | Good | 44 | 64 | 1 | **reference** |
| **Attitude** | Negative | 11 | 14 | 1.468 (0.571 – 3.774) | 1.249 (0.476 – 3.277) |
| | | | | 0.426 | 0.651 |
| | Positive | 48 | 78 | 1 | **reference** |
| **Occupation** | General Surgery | 21 | 38 | 1 | **reference** |
| | Internal medicine residents | 14 | 15 | 2.605 (.921-7.369) | 0.474 (0.180-1.252) |
| | | | | 0.071 | 0.132 |
| | Og/Gyn Residents | 17 | 25 | 2.542 (0.934-6.922) | 0.699 (0.299-1.633) |
| | | | | 0.068 | 0.408 |
| | Anaesthesia Residents | 7 | 14 | 0.564 (0.236-1.348) | 1.012 (0.338-3.033) |
| | | | | 0.197 | .983 |
| **Age** | **20-29** | 36 | 58 | 1.088 (0.529-20.230) | .917 (0.434-1.940) |
| | | | | 0.818 | 0.822 |
| | **30-39** | 23 | 34 | 1 | Reference |
| **Year of experiance** | **<2 years** | 16 | 35 | 1.589 (0.750-3.368) | 1.777 (0.820-3.849) |
| | | | | 0.226 | .145 |
| | **>3 years** | 43 | 57 | 1 | Reference |

# 6. DISCUSSION

## 6.1 introduction

This chapter presents the discussion of our results in comparison to researches done elsewhere. Specific variables concerning KAP of participants and general findings assessing the overall knowledge and attitude as well as their relationship with the practice of facemask utilization among health practitioners will be discussed in sideline with reviewed literature.

75.5 % of our respondents are males and the rest are females; this might be due to the male predominance in proportion that is apparent in most post graduate departments.

## 6.2 Knowledge of respondents

Face masks are used as a protective barrier to reduce the risk of transmission of microorganisms between patients, HCWs, and the environment. However, in order for face masks to provide effective protection, the HCWs must have a good knowledge of wearing and disposing of it.

**In our study the overall good knowledge** of respondents was **71.5%** while **28.5%** were found to have poor level knowledge. A study from ***Pakistan*** [1] reported the overall good knowledge of respondents to be **35.2%**, intermediate knowledge 45.4% and poor level knowledge 19.3% among healthcare practitioners. In comparison to the above study the overall good level knowledge was found to be significantly superior in our study. The probable reason could be the difference in assumed medical knowledge of the study population. The study population of the later was consultant, medical officer, postgraduate trainee, house officer, and paramedical staff while; the study population in our study is just resident physicians.

**Specifically** knowledge towards correct use of facemask was assessed using **in depth questions**. **The side of facemask facing in or out**, **the number of layers** in a surgical face mask, if **wearing a surgical mask protect from COVID-19 spreading**, **type of masks** actually protect against COVID-19, which **layer of the mask acts** as a filter media barrier, **Extent of face that should be covered with surgical facemask**, how many **hours a physician can wear a surgical mask**, purpose of the **metal strip** and finally if the **cloth facial mask** is as effective as surgical facemask were assessed.

94.7% of our respondents reported white side of facemask facing in as a correct way of using it. The Pakistani study [1] reported 56.4% for correct use of facemask while, a study from Saudi Arabia [3] reported 86.2% to use facemask correctly. Our study showed significantly higher knowledge level towards correct use of facemask, this can be due to the knowledge level of our source population which is assumed to be higher. Regarding the number of layers in facemask, 69.5 % of our participants reported correctly while 68.9% were reported in the Pakistani [1] study, which is comparable.

90.7% of our responders reported using facemask protects from covid-19 while 71 and 79% of responders said facemask protects from Covid-19 in the Pakistani and Saudia-Abian studies respectively. This can be due to the continuous on job training that is provided to our residents, which is not reported in the later studies. Concerning the type of facemask that actually protect against covid-19 only 51.7% of our participants responded correctly saying 95% BFE and PFE. This numbers goes up to 65% in both the Pakistani and Saudi papers, which is significantly higher than our report. This could be due to the facemask our residents continually use which doesn't have proper bacterial and parasitic filter medium.

The middle layer of facemask is the one acting as a filter medium. 58.9% of our respondents answered that correctly. The Pakistani and Saudi papers reported 53 % 65% respectively, which is comparable with our study.

Concerning the Extent of face that should be covered with surgical facemask, 98.7% of our participants answered correctly saying; nose, mouth and chin should be covered. The Pakistani [1] & Saudi [3] papers reported a 74.7% & 86.2% respectively. Our finding is significantly higher than both which can be attributed to the academic caliber of our respondents.

When coming to the number of hours a HCW can wear a faceamask, only 53% of our participants answered correctly saying 8 hours which is comparable with the 51% reported from the Saudi study [3]. While a significantly higher number, 75.8% was reported in Pakistan [1].

Finally, 96.7% and 85.4% of our respondents reported correct answers for purpose of metal strip and benefit of surgical over cloth facemask respectively. 92 and 88% was reported in the Pakistani study respectively. 100% and 82% was reported in the Saudi study. Which are generally comparable.

### 6.3 Attitude of respondents

Attitude of respondents were reported via assessing five attitude parameters mentioned in previous chapter. The overall respondents with positive attitude towards using facemask were found to be **83.4%** in addition the confidence level of respondents were found to be **85.4%** in our study. In comparison to other studies which reported 88.5% [1] and 93.1 %[3]; our finding is comparable.

### 6.4 Practice of respondents

There is enough evidence to prove that wearing a surgical mask protects every person from COVID-19. The WHO currently recommended that not only HCWs and people who are ill and those who are caring for the ill but also the general population need to wear a mask to protect themselves from COVID-19. However, in low-income countries like Ethiopia, where the incidence of infectious disease is high and the hospital environmental conditions are often poor, our HCWs rely almost entirely on a face mask to limit the spread of COVID-19.

Regarding practice of responders; **Removing facemask while talking with patients**, **Reuse** of facemask for late use, **public use** of face mask, **hospital use** of facemask, **disposal** of facemask in proper bag and **presence of enough** facemask for daily use were assessed. 98.7 % of our participants reported not to remove facemask while talking to patients which is comparable with 86% [1] and 96% [2] reported in other studies.

47% of our participants reuse facemask for later use. Similar parameter was reported 79% [1] and 72% [3] responders from Pakistani and Saudi studies respectively reported not to store facemask for late use. This significant discrepancy could be due to inadequate provision of facemasks in our hospital.

Subsequently, public and hospital utilization of facemask was assessed. And 98% of our participants responded they use facemask for both hospital and public purposes; which is comparable with 94% and 100% reported from Pakistan [1] and Saudi [3] studies respectively.

Concerning using proper color-coded bag to dispose off facemask only 47% responded correctly saying “yellow”; which is comparable with 45% reported in Pakistan [1]. But, 68% of HCW’s in Saudi study reported correctly, which is significantly higher than our study. This could be due to the higher quality of care in Saudi COVID centers and hospitals.

## 7. LIMITATION AND STRENGTH OF THE STUDY

### 7.1 Limitation

The findings of the study are confined to a group of physicians who reside a single tertiary hospital, which does not necessarily reflect the situation among HCWs in other institutions, which could be a potential limitation. Furthermore, this study was conducted among only resident physicians that don’t reflect on the general KAP of HCWs.

### 7.2 Strength

The study tried to thoroughly assess the KAP of residents on proper use of facemask and identified major gaps to be filled.It also tried to dig the associated factors so that it recommends interdepartmental knowledge sharing.

# 8. CONCLUSION AND RECOMMENDATION

## 8.1. Conclusion

Even though knowledge and attitude of residents regarding utilization of facemask was found to be good, the practice was poor. In addition some departments were found to have better knowledge of facemask utilization compared to others. This findings calls for better awareness regarding several aspects such as the types of masks, the duration of using masks and the proper disposal of the masks.

## 8.2 Recommendation

### 7.2.1 Recommendation for practitioners

Practitioners should update themselves on recent publications. They should have skills on proper use of facemask. Inter-departmental knowledge sharing is also recommended.

### 7.2.2 Recommendation for Health policy makers

Workshops, Conferences and continuous medical education lectures are required to improve the awareness of health care providers regarding the proper use of face mask. Proper PPE including facemask and disposal bags should be provided for hospitals.

### 7.2.3 Recommendation for other researchers

Proper use of facemask among HCW is not duly explored internationally and also in our country. Other researches should use this research as an input to expand our horizon of knowledge towards proper utilization of facemask

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# 10. ANNEX

## Annex: 1 Subject information sheet

**Addis Ababa University collage of health science School of medicine department of anesthesiology**

Hello, my name is ----------, I am here in behalf of Dr. Dagem Tsegaye, final year Anaesthesia resident at Addis Ababa University School of Medicine department of Anaesthesia, critical care and pain medicine. He is conducting a research on "Knowledge, attitude and practice of health care workers in using face mask for prevention of spread of novel corona virus at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia". He has received permission from Addis Ababa University School of medicine and from Tikur Anbessa specialized hospital officials to conduct the study.

You are selected to participate in this study because you are currently working as a health care provider in this facility. Your participation in this study will only be based on your willingness to participate. You have the right to choose not to take part in this study. If you are willing, you have the right to stop at any time or withdraw without giving any reason which you will not be subjected to any ill-treatment. There will be no direct benefit by participating in this study but in future information gathered by this study will helps policy makers, programmers and researchers to give appropriate attention on issues use of face mask by health care workers.

The information that you provide will be kept confidential by using only code numbers and locking the data. Only the members of the study team will have the access to the non-coded data and the data will not be used for purposes other than the study. Your willingness and active participation is very important for the success of this study.

If you need any further information or explanation regarding to the study, you can have this address to contact.

Name: Dr. DagemTsegaye

Tel- +251-912390887 Email- dagimannn2@gamil.com

Based on the understanding of the above information, are you willing to participate in this study?

A) Yes B) No B)If yes, Signature ---------- Date----------

## Annex: 2 English questionnaire

Addis Ababa University College of Health Science School of Medicine Department of Anesthesia, Critical Care and Pain Medicine

Questionnaires to assess the knowledge, attitude and practice of health care providers in using face mask for prevention of spread of novel corona virus.

**Part 1: Sociodemographic characteristics**

| S.no | Questions | Response | |
|---|---|---|---|
| 1 | Age | 1. 20-29<br>2. 30-39<br>3. 40-49<br>4. 50 or more | |
| 2 | Gender | 1. male<br>2. female | |
| 3 | Occupation | 1. Anesthesia resident<br>2. Internal medicine resident | |
| 4 | Years of experience | 1. 1-2<br>2. 3-10<br>3. 11-20<br>4. 21-30<br>5. 31 or more | |

**Part 2: Questions related to knowledge**

| S.no | Questions | Responses | |
|---|---|---|---|
| 5. | Which is the correct way of using surgical face mask to protect against COVID-19? | 1. White side facing in<br>2. White side facing out | |
| 6. | How many layers did surgical mask contain? | 1. Two | |

| | | | |
|---|---|---|---|
| | | 2. Three<br>3. Four | |
| 7. | Wearing a surgical mask protect from COVID-19 spreading? | 1. Yes<br>2. No | |
| 8. | Which type of masks actually protect against COVID-19? | 1. 91% BFE and PFE*<br>2. 95% BFE and PFE<br>3. 97% BFE and PFE<br>4. 99% BFE and PFE | |
| 9. | Which layer of the mask acts as a filter media barrier? | 1. First layer<br>2. Middle layer<br>3. Last layer | |
| 10. | For how many hours a physician can wear a surgical mask? | 1. 1 hours<br>2. 2 hours<br>3. 4 hours<br>4. 8 hours | |
| 11. | To what extent did Surgical mask should cover? | 1. Nose only<br>2. Nose and mouth<br>3. Nose, mouth and chin | |
| 12. | Which is the correct way of using surgical face mask to protect against COVID-19? | 1. White facing in<br>2.White side facing out | |
| 13. | What is the main purpose of the metal strip on a surgical mask? | 1. To fit on the nose<br>2. To fit on the chin<br>3. No purpose | |
| 14. | Is the cloth facial mask as effective as a regular surgical facial mask? | 1. Yes<br>2. No | |

**Part 3: Questions related to Practice**

| S. no | Questions | Response | |
|---|---|---|---|
| 15. | During clinics, if there is a need to talk to the patient, will you remove your mask? | 1. Yes<br>2. No | |
| 16. | If you are not sick, do you store the used surgical mask in a bag for later use? | 1. Yes<br>2. No | |
| 17. | Do you wear a mask in public places to protect yourself against COVID-19? | 1. Yes<br>2. No | |
| 18. | Do you wear a mask in hospital premises to protect yourself against COVID-19? | 1. Yes<br>2. No | |
| 19. | In which color-coded bag you dispose of your mask? | 1. Black-coded bag<br>2. Blue-coded bag<br>3. Red-coded bag<br>4. Yellow-coded bag | |
| 20. | Do you have enough amount of face mask for your daily use? | 1. Yes<br>2. No | |

**Part 4: Questions related to Attitude**

| S. no | Questions | Response | |
|---|---|---|---|
| 21. | Are you confident enough to know the correct steps of wearing a face mask? | 1. Yes<br>2. No | |
| 22. | Wearing face mask can protect you from getting COVID 19 infection | 1. Strongly agree<br>2. Agree<br>3. Disagree<br>4. Strongly disagree | |
| 23. | Wearing face mask can protect people around you from COVID 19 infection | 1. Strongly agree<br>2. Agree<br>3. Disagree<br>4. Strongly disagree | |

| | | | |
|---|---|---|---|
| 24. | Only people with respiratory symptoms should wear face mask | 1. Strongly agree<br>2. Agree<br>3. Disagree<br>4. Strongly disagree | |
| 25. | Wearing face mask can replace other preventive ways of COVID 19 infection | 1. Strongly agree<br>2. Agree<br>3. Disagree<br>4. Strongly disagree | |

## Annex 3: Mean value for overall respondents of major dependent and independent variables

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Overall practice | 151 | 2 | 6 | 4.24 | .943 |
| Overall attitude | 151 | 0 | 5 | 2.91 | .711 |
| Overall Knowledge | 151 | 3 | 9 | 6.99 | 1.180 |
| Valid N (list wise) | 151 | | | | |