Preparedness and Approaches of Health Care Providers to Tackle the Transmission of COVID-19 Among South Gondar Zone Hospitals, Amhara, Ethiopia, 2020.

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Research

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Abstract

Objective: Preparedness and approaches of health care providers to tackle the transmission of covid-19 among South Gondar zonal hospitals 2020

Result: In this study a total of 422 health providers were interviewed from south Gondar zonal hospitals and overall response rate was 100%. The mean range 35 ± 6 and minimum and maximum ranges of age were between 23 to 50 years and more than three fourth of the providers age range was > 35 years. Regarding professions 203(48.1%), 112(26.5%) were nurses and midwifes respectively. The result over all was not good; people were not prepared preparedness of essential materials, equipments including psychological buildings of health providers in each hospital.

Background

Corona virus disease 2019 (COVID-19) is an emerging respiratory disease that is caused by a novel corona virus and was first detected in December 2019 in Wuhan, China. Disease is highly infectious, and main clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea (1). Corona viruses distributed among humans, other mammals and have been implicated to cause respiratory, hepatic, gastrointestinal and neurological infections.(2).

The newly emerged novel corona virus from China has become a global health issue (3). Individuals with confirmed 2019-nCoV viruses have a clinical symptoms of fever, cough, and shortness of breath both lower and upper respiratory system (4, 5). In contrast to sever acute respiratory syndrome and middle east respiratory syndrome, recently happened beta corona viruses, 2019-nCoV have mild clinical systems with low mortality rate (6). The time of incubation tends to be from two days to up to two weeks after acquiring the infection (5, 7).

SARS-CoV which causes SARS, has a unique pathogenesis because it causes both upper and lower respiratory tract infections(8). The initial result showed that SARS-CoV isolated from masked palm civets (9). The primary reservoir of SARS-CoV was putatively bat (10).

Study done at Saudi Arabia and adjacent countries MERS-CoV was derived from the nasal swabs of camel, and emerged in the Middle East with 2494 confirmed case and 858 death sequel (11). Its case fatality was approximately 36% over 26 countries, making MERS-CoV as one of the most devastating virus known to the human (12).

Route of transmitting among people directly via the respiratory droplets and secretion and indirectly through contaminated inanimate surfaces(13). Epidemiological investigations, the incubation period of the SARS-CoV-2 is between 1–14 days and virus has been found to be contagious in the asymptomatic patients (14).

Materials And Methods
Study design, setting and area

An Institutional-based cross-sectional study design was conducted from May to June 2020 in south Gondar Zonal hospitals, Amhara region, which is 666km far from Addis Ababa, the capital of Ethiopia. South Gondar zone is one of the zones in the Amhara regional with population of 2,485,552. There are 6 primary Hospitals and 1400 health professionals.

Population

Source population

All health care providers

Study population

All health care providers who were working in South Gondar public hospitals during the study period

Sample population

Selected health care providers

Inclusion and exclusion criteria

Inclusion criteria

All health professional

Sample size determination

The sample size have been calculated using a single population proportion formula as follows with 95 % confidence level, and marginal of error 5%, 10% non-response rate; final sample size for this study was 422

Sampling technique and procedure

Respondents were allocated proportionally based on the number of the health workers. Study participants who fulfill the inclusion criteria were selected by systematic random sampling every two interval.

Data collection tools and procedures

Data was collected through a self-administered questionnaire and observation for the practice of standard precaution in fighting against COVID-19 pandemic. Study instrument was adapt from risk communication & community Engagement action plan guidance of WHO COVID-19 preparedness & response and related literatures (17, 18). Questionnaire was divided into 4 parts, demographic information, practice of standard precaution, mental preparedness of respondents evaluated with
strongly agrees, agree, disagree and strongly disagree response and finally we compute to agree and disagree.

**Data Quality Assurance**

The data collection tools were pretested three days prior to the actual data collection time with 5% of sample size of 21 health care providers at Bahirder Hospital and necessary adjustment was made.

**Data analysis**

Data was entered and analyzed using SPSS 23 statistical software. Descriptive analyses run first with proportion and summary statistics to describe the study population in relation to relevant variables by considering statistical assumptions.

**Variables**

**Dependent Variables**

Covid-19 preparedness among healthcare providers

**Independent Variables**

Socio demographic indicator variables like

- Age, Sex
- Types of profession
- Educational Status
- Work experience
- Marital status
- Department

**Operational definition**

**Self-satisfaction**: participants were classified as being satisfied of tools assessment to prevent corona virus disease pandemic, among 7 questionnaires, if a response rate was scored >4 questions put as satisfactory if <4 unsatisfactory

**Social status related**: participants were classified being as agree and disagree on the perceptions of prevent transmission and treatment of corona virus disease from person to person

**Place of work related questions**: Among 8 questions, respondents were scored >4 = good and <4 poor

**Infection prevention related**: participants were assessed preparedness of tools including PPE as a methods of infection prevention among 5 questions, scored >3 = good and scored <3 poor
Results

Socio demographic characteristics of health providers

In this study a total of 422 health providers were interviewed from south Gonder zonal hospitals and overall response rate was 100%. The median (+IQ range) age of health provider was 40 Std. deviation 6±4 and minimum and maximum ranges of participants were 23 to 50 years and more than three fourth of the providers age range was >35 years around 255(60.4). Among the total respondents 341(80.8%), 81(19.2%) were males and females respectively. Regarding on marital status 336(79.6%) of the study subjects were married and 203(48.1%), 112(26.5%) of professions were nurses and midwifes respectively and then less than (7.8%) were other departments like anesthesia, Laboratory and pharmacy. Majority of respondents 114(27%), 95(22.5%) had ve and four years of work experience respectively. Among the total respondents, (63.9%), (40.7%) were in progress and not availed in their infection prevention materials and personal protective equipments with less than (7.9 %) of completed prior preparedness of materials and PPE (Table 1).

Table 1. Sociodemographic characteristics of health providers
| Variables             | Category                                      | Frequency (N=422) | Percent |
|-----------------------|-----------------------------------------------|-------------------|---------|
| Providers age         | <20                                           | 0                 | 0       |
|                       | 20-35                                         | 167               | 39.6    |
|                       | >35                                           | 255               | 60.4    |
|                       | Total                                         | 422               | 100.00  |
| Marital status        | Married                                       | 336               | 79.6    |
|                       | Single                                        | 86                | 20.4    |
| Religion              | Orthodox                                      | 336               | 79.6    |
|                       | Muslim                                        | 86                | 20.4    |
| Professions           | Physicians                                    | 15                | 3.6     |
|                       | Nurses                                        | 203               | 48.1    |
|                       | Midwives                                      | 112               | 26.5    |
|                       | Pharmacist                                    | 31                | 7.3     |
|                       | Laboratory technologist                       | 28                | 6.6     |
|                       | Others (mental H, anesthesia and optometrist) | 33                | 7.8     |
|                       | Total                                         | 422               | 100.00  |
| Year of experience    | 1-4                                           | 117               | 27.7    |
|                       | 5-10                                          | 215               | 50.9    |
|                       | 11-15                                         | 55                | 13      |
|                       | 16-20                                         | 35                | 8.3     |
|                       | Total                                         | 422               | 100.00  |
| Educational Level of respondents | Diploma                           | 123               | 29.2    |
|                       | Degree                                        | 203               | 48.1    |
|                       | Master                                        | 41                | 9.7     |
|                       | Specialists                                   | 55                | 13      |
|                       | Total                                         | 422               | 100     |

Practice assessment on standard precaution against COVID-19
Covid-19 is a new and contagious disease in the world that is why health providers in each hospital have practicing the following general precautions for prevention and treatment of infectious respiratory diseases of covid-19 were taken to help prevent people. questions, were prepared and asked about using appropriately personal protective equipments by using never, sometimes, seldom and often questions, we can see that perceptions of using PPE and disinfections of materials before and after procedure have significant gaps between the amount of information available about covid-19 and adaptation of wearing personnel protective equipments and hand washing practice using soap and water were poor (Table:2)

Table: 2 Practice assessments on standard precaution against COVID -19
| Variables                                                                 | category               | Frequency (N=422) | Percent |
|--------------------------------------------------------------------------|------------------------|-------------------|---------|
| Wear appropriate medical mask at all time                                | Never                  | 228               | 54      |
|                                                                          | Seldom                 | 36                | 8.5     |
|                                                                          | Sometimes              | 158               | 73.4    |
|                                                                          | Often                  | No                | No      |
|                                                                          | Very Often             | No                | No      |
| Put on protective eye glass always during procedure                      | Never                  | 108               | 25.6    |
|                                                                          | Seldom                 | 86                | 20.4    |
|                                                                          | Sometimes              | 228               | 54      |
|                                                                          | Often                  | No                | No      |
|                                                                          | Very often             | No                | No      |
| All body fluid and aerosol droplet considered as biohazards              | Often                  | 336               | 79.6    |
|                                                                          | Very often             | 86                | 20.4    |
|                                                                          | Total                  | 422               | 100.00  |
| Wash hands with soaps and water for 20” before and after procedure      | Sometimes              | 194               | 46      |
|                                                                          | Often                  | 228               | 54      |
|                                                                          | Total                  | 422               | 100.00  |
| Put-on gown/plastic apron when you do every procedure and gloves        | Seldom                 | 72                | 17.1    |
|                                                                          | Often                  | 264               | 62.6    |
|                                                                          | Very often             | 86                | 20.4    |
|                                                                          | Total                  | 422               | 100.00  |
| Instrument processing and waste management                              | Sometimes              | 264               | 62.6    |
|                                                                          | Often                  | 158               | 37.4    |
|                                                                          | Total                  | 422               | 100.00  |
| Keep physical distancing of 2 arms lengths except physical examination  | Seldom                 | 36                | 8.5     |
| espacial cases                                                          | Sometimes              | 72                | 17.1    |
|                                                                          | Often                  | 314               | 74.4    |
### Preparedness of tools and approaching methods

#### Self satisfactory towards perception of COVID-19

Among the 7 self satisfaction questions of perceptions to give service for covid-19 pandemic disease, Majority of respondents were satisfactory, which was answered >4 questions agree < 4 were disagree that was unsatisfactory 214 (50.7%), 208 (49.3%) respectively.

#### Social status towards preventive measures of COVID-19

In our study, participants believed that in all 6 questions regarding social related assessments 242 (57.3%), 180 (42.7%) of participants were agreed and disagreed respectively to limit their social activities, transmit to their family, not disclosing to their families if covid-19 positive because of avoid them and agree to live alone if positive COVID-19.

#### Work place related questions towards prevention/treatment of covid-19

Among the eight questions >4 and < 4 questions having assigned final agreed and disagree. Therefore 255 (60.4%), 167 (39.6%) respectively were agree and disagree of prevention COVID-19 disease since increases their work load, institution does not support if COVID positive, perceptions if absence of work place can reduce transmission and even if they can change current job from health to para health.

#### Infection prevention measures of covid-19

The status of the general health providers in each hospital towards preparedness of infection prevention equipments, were asked 5 questions. Answering and scoring system was good and poor if answered >3 and <3 among 5 questions. (Below pie chart 1)

#### Availability of infection prevention materials and personal protective equipments

Study was not completely prepared materials and PPE beyond activities that involve close contact with a suspected or confirmed case of COVID-19, and not only COVID-19 but also for regular activities in each hospitals were in progressing of availability infection prevention materials and ensure the health care providers were not applying standard precautions for all patients. All hospitals were not ready to prepare essential equipments and team of health care workers were not received training in order to prevent standard, contact, droplets, and airborne precautions. (Table: 3)
Table 3: Assessment of tool preparedness in South Gondar zone public hospitals

| Variables                                                                 | Category     | Frequency | Percent |
|---------------------------------------------------------------------------|--------------|-----------|---------|
| Health care workers (HCW), patients, and visitors are aware of respiratory and hand hygiene. Provide verbal instructions, informational posters, cards, etc. | No           | 195       | 46.2    |
|                                                                            | In progress  | 186       | 44.1    |
|                                                                            | Complete     | 41        | 9.7     |
|                                                                            | Total        | 422       | 100.00  |
| Ensure that HCW are applying standard precautions for all patients.        | No           | 189       | 44.8    |
|                                                                            | In progress  | 206       | 48.8    |
|                                                                            | Complete     | 27        | 6.4     |
|                                                                            | Total        | 422       | 100.00  |
| Droplets and contact precautions are prepared for suspected or confirmed COVID-19 cases | No           | 186       | 44.1    |
|                                                                            | In progress  | 207       | 49.1    |
|                                                                            | Complete     | 29        | 6.9     |
|                                                                            | Total        | 422       | 100.00  |
| Team of HCWs received training on standard, contact, droplets, and airborne precautions | No           | 73        | 17.3    |
|                                                                            | In progress  | 321       | 76.1    |
|                                                                            | Complete     | 28        | 6.6     |
|                                                                            | Total        | 422       | 100.00  |
| Available adequate personal protective equipment (PPE) (i.e., medical/surgical masks, N95, gloves, gowns, eye protection) | No           | 190       | 45      |
|                                                                            | In progress  | 219       | 51.9    |
|                                                                            | Complete     | 13        | 3.1     |
|                                                                            | Total        | 422       | 100.00  |

Discussion
In our study area, this is the first study towards tackling COVID-19 by prior preparing things which are essential like personal equipments and other material to be ready in all hospitals. Indicating that most respondents found (50.7%) were satisfactory on the preparedness assessment tool questions and (57.3%) participants were agreed with their perceptions of socially approached methods (60.4%). Strength of psychological buildings of individuals had huge gaps between.

Among the respondents, more than half (54.3%) had poor response because of health providers were not have a got adequate information available on COVID-19 of infection prevention methods, particularly about the mode of transmission and appropriate use of personal protective equipments. About (56.8%) of availability of infection prevention and personnel protective equipments were in progress, psychological buildings.

**Conclusion**

Over all result was not good; people were not prepared preparedness of essential materials, equipments including psychological buildings of health providers in each hospital.

**Declarations**

**Ethics approval and consent to participate**

Ethical approval was applied from Ethical Review Board of Debre Tabor University. An informed written consent was obtained from participants to fill the questionnaires. Privacy and confidentiality of information was kept by replacing all names with codes. Each study subject was informed about the objective of the study. A letter of cooperation was obtained from College of Health science for all Health facilities to participate in this study.

**Consent for publication**

Not applicable in this study

**Availability of data and materials**

Data sets in this study are available from the corresponding authors on reasonable request

**Competing interests:**

The authors declare that they have no competing interests

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Authors’ contributions

MB participated in designing the study, gives training on data collection, supervising during data collection, analyzes the data and wrote over all research including manuscript. HG contributed in the designing of the data collection, analysis of the data, data processing, data collection and analysis the data. All authors read and approved the final manuscript. DA contributed in the designing of the data analysis

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Abbreviations

SARS: Sever acute respiratory syndrome, MERS: Middle East respiratory syndrome, WHO: world health origination, DGH: Debre Tabor general hospital, AOR: Adjusted odes ratio, COVID: Coronavirus-19 disease, PPE: personal protective equipment

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