Tigest Abebaw Zewdie, Natnael Habtamu Abegaz, Abera Kumie, Yodit Abraham Yaynishet, Natan Wondwossen Elssa, Abel Tenaw Tassama, Desalew Mekonnen. *Ethiop Med J, 2021, Vol. 59, No. 3*

ORIGINAL ARTICLE

ASSESSING THE PROGRESS OF PRIMARY MEASURES TO PREVENT COVID-19 TRANSMISSION AT THE GATES OF A TERTIARY HOSPITAL IN ADDIS ABABA

Tigest Abebaw Zewdie, MD[1*], Natnael Habtamu Abegaz, MD[2] , Abera Kumie, PhD[3] , Yodit Abraham Yaynishet, MD[1] , Natan Wondwossen Elssa, MD[1] , Abel Tenaw Tassama, MD[1] , Desalew Mekonnen, MD[1]

ABSTRACT

Introduction: *COVID-19 is a major global threat. A proven way to decrease its spread is by applying preventative measures such as proper physical distancing, hand hygiene and respiratory hygiene practices.*

Objective: *To assess the status of measures to prevent COVID-19 transmission by patients, attendants and health care workers at the gates of Tikur Anbessa Specialized Hospital.*

Methods*: An institutional based cross-sectional study was conducted on all patients, attendants, health care workers and support staff entering the premises of Tikur Anbessa Specialized Hospital between 7:45 to 9:30 am via three gates from June 22 to August 30, 2020. A systematic random sampling method was employed to select 20 participants from each gate to observe twice weekly the status of individual behavior on hand and respiratory hygiene and physical distancing.*

Results*: Overall, 1000 individuals were involved in the study. From this 568 (56.8%) were men. The majority 79.6 (79.6%) were in the estimated age group (by observation only and not asked) of 18 to 50. Altogether, the practices of proper hand hygiene, proper physical distancing and proper utilization face mask were 10.7%, 77.3% and 86.9%, respectively, over the period of 10 weeks.*

Conclusion*: There was an overall good practice of social distancing and mask usage. On the contrary, hand hygiene practice was remarkably low. Enforcement issues and shortage of infrastructures were key challenges observed in this study*

Key words*: Covid-19, Tikur Anbessa Specialized Hospital, physical distancing, respiratory hygiene, hand hygiene*

INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a new strain that has not been previously identified in humans and is the cause of COVID -19.(1) Common transmission routes include direct transmission (cough, sneeze, and droplet inhalation transmission) and contact transmission (contact with oral, nasal, and eye mucous membranes). (2) This emerging respiratory disease was abbreviated as COVID 19, after it has been first reported in December 2019 in Wuhan city of China. (3) As of September 28, the pandemic has infected more than 33 million people with upwards of 1,002,394 deaths. (4)

In Ethiopia the first corona case was confirmed on March 1, 2020 March and as of September 28, 2020 there are 73,944 infected cases and 1,177 death.(4) In response to this pandemic, the government declared a state of emergency on April 8. Subsequently, several essential measures were taken including mandatory quarantine periods for travelers, restrictions on public gatherings, school closures, mandatory facemasks, physical distancing in public places, hand hygiene practice at entrances of public, fewer passengers using public transport and risk communication on prevention. Similarly, Tikur Anbessa Specialized Hospital (TASH) has made strides by forming an Emergency Operating Committee (EOC) on March 16 with the main objective of prevention, control and management of the disease in the hospital. To effect this smoothly in the midst of the pandemic it is collaborating with key stakeholders like the Ministry of Health to design locally contextualized effective prevention and intervention.

(6)Some of its work are installing hand hygiene facilities at different areas, thermal temperature screening, limiting the number of attendants, labeling the gates based on use, mandating universal masking, ensuring physical distancing and hand hygiene at entrances. Despite all these efforts, there has been a progressively increasing number of confirmed cases among patients, attendants and staff of the hospital.(7)

When faced with similar predicaments in other hospitals of the country, a multicenter study was done and showed poor practice of the preventive measures relative to other countries despite good knowledge and positive attitude.

[1]School of Medicine, College of Health Sciences, Addis Ababa University.
[2]Independent Practice, Addis Ababa, Ethiopia.
[3]School of Public Health, College of Health Sciences, Addis Ababa University.
*Corresponding Author E-mail: tigestabebaw8@gmail.com

The shortage of infrastructure had been implicated as possible reasons for this difference. (8)However, there is only limited data regarding this subject, especially in our country's set up including TASH.

This study aims to determine the magnitude of proper mask utilization, hand hygiene and physical distance practices at the gates of TASH. It will also identify challenges for implementation of these practices as it could potentially be used as ancillary data for future studies.

MATERIALS AND METHODS

Study area: The study was undertaken at the 3, out of 4 gates of TASH ; i.e. Gate 1 (Fana gate), Gate 2 (Staff gate) and Gate 3 (Merkato Gate). Since the era of COVID-19, regulations at TASH have been more stringent regarding its four entrance gates. Gate 1 is strictly designated for the entrance of patients and attendants. Gate 3, is also designated for this same purpose. Whereas Gate 2 and Gate 4 also called Staff gates are solely for the entrance of health care workers and support staff members. Gate 4 was not included in the study as it has only been opened in recent times and is rendering its services currently at a low flow of staff compared to Gate 3.The study was done from June 22 to August 30, 2020, stretched over 10 weeks.

Study design*:* An institution based repeated cross-sectional weekly survey was conducted. There were twice observation involving week day and weekend. Monday was chosen for its regular maximum flow of patients through the gates. Saturday was taken to consider the variability with the week day. Hospital records and pilot survey were used to decide on the observation days.

Study subjects: The source population for this study was all patients, attendants, health care workers and support staff entering TASH premises via gates 1, 2, and 3 on Monday's and Saturday's All patients, attendants, health care workers and support staff entering TASH premises via gates on Monday's and Saturday's were observed.

Sampling procedure: A systematic random sampling method was used to select 20 participants from each gate.

Data collecting instruments*:* anonymous observers were standing inconspicuously around the gates to observe individuals behavior on primary preventive practices. This observation technique was chosen to establish uncontrolled behaviors during the entrance to the hospital.

A brief checklist containing sex, estimated age group (by observation only and not asked) , practice of preventive measures (hand hygiene, physical distancing, and respiratory hygiene) was used to collect data. The checklist and the observation technique were pre-tested to ensure their validity.

Operational definitions: the following WHO definitions were used for this study (9, 10).

- **Proper physical distance** means at least 1m distance between the individuals.
- **Proper hand hygiene** means washing one's hands with soap and water for 20 seconds or using alcohol-based hand sanitizers.
- **Proper respiratory hygiene** means wearing a face mask that covers the entire nose, mouth and chin.

Data management and analysis*:* the data was filled, stored and analyzed with MS- excel. Descriptive statistic was used to analyze the data.

Ethical consideration: Confidentiality and privacy were carefully kept up all through the whole study time frame.since this was a covert research with no direct involvement with patients and human kind . As such a proper ethical clearance from the college IRB was found not necessary.

RESULTS

Sociodemographic data

A total of 1000 individuals were observed in this study. From this 568 (56.8%) were men and the remaining 432(43.2%) were female. The majority 79.6% were in the estimated age group (by observation only and not asked) of 18 to 50 while those below 18 and those above 50 comprised 3.2% and 17.2% respectively.

The status of physical distancing, respiratory and Hand hygiene practice

Overall, only 10.7 % of them had proper hand hygiene. Comparing among the gates, gate 3 had the highest performance with average practice of 11.4% while gate 2 and gate 1 had respectively rate of 10.3% and 7.3%.

The trend of hand washing practice during the first 4 weeks was very low and declining, it started to pick up at the end of the 4th week, reached about 50% on week 6, then declined rapidly and leveled off at week 9.

Table 1: Sociodemographic data of individuals observed at the entrance gates, TASH, 2020

Site	Sex		Estimated Age Group		
	Male# (%)	Female# (%)	<18 # (%)	18-50 # (%)	>50 # (%)
Gate 1	242(24.2)	158(15.8)	11(1.1)	313(31.3)	76(7.6)
Gate 2	94(9.4)	106(20.6)	0	175(17.5)	25(2.5)
Gate 3	232(23.2)	168(16.8)	21(2.1)	308(30.8)	71(7.1)
Total	568(56.8)	432(43.2)	32(3.2)	796(79.6)	172(17.2)

Gate 1 & 2: Patient entrance; Gate 3: staff entrance

Regarding physical distancing, the average practice percentage of all the gates was 77.3 percent. Individually, there was performance of 69.8%, 81.1% and 79.9% at gate 1, 2 and 3 respectively. There was comparable result among weeks with highest record of 84% on week 3 and lowest on week 8.

Among all observed 86.9% had proper face masking. Gate one and two had result of 90.3% and while gate three had the least practice (80.5%).

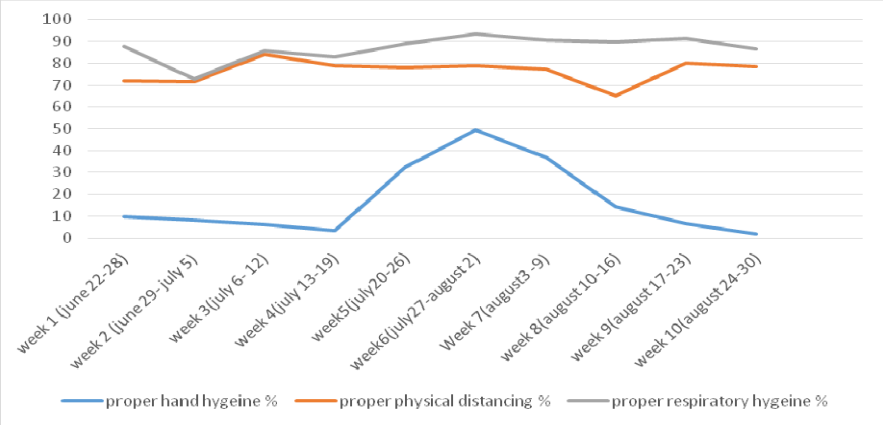

Figure 1: Weekly variations of covid-19 preventive measure practices at the entrance gates of TASH, 2020

Additional observational data

There was inadequacy and misuse of hand hygiene facility at all gates with some improvement observed on week 5 and 6. Service rendering areas like washing basins, thermal screening, information desk, and areas just outside the gates were particularly overcrowded. In addition, some people were entering without their temperatures checked. There were no adequate posters and reminders. For the most part, there was a lack of enforcement at all the gates

DISCUSSION

As per the recommendation of WHO, implementation of preventative measures such as proper physical distancing, hand hygiene and respiratory hygiene is imperative to slow down the pandemic. As such, application of these measures was studied at the gates of TASH.

The practice rate of hand hygiene was found to be only 10.7% which was much lower as compared to studies done in Addis Zemen Hospital (65.5%) and Jimma (77.3%) (11, 12). This could be highly attributed to the shortage in facilities and inconsistent enforcement and in part due to the additional observations listed on the result as well as the difference in the study methodology.

There was a great upsurge in the hand hygiene practice in week 5 and 6.i.e from 3.3 to 49.2. This was the time where good provision of water and soap were observed and the people assigned at the gate like security guards, staffs assigned for thermal screening were making sure each person had washed their hands, wore masks and had proper social distancing. But as soon as the enforcement got loose, the practice regressed dramatically in the weeks to follow from week 7 to 10. This underlines the need for constant monitoring and adequate provision of necessary facilities.

The hand hygiene practice at the staff gate was 10.3% which was much lower than the hand hygiene practice of health care workers elsewhere in Ethiopia (81.4%). (8) Owing to this is the fact that security guards and thermal screening workers felt uncomfortable enforcing the measures to the staff that are mostly health care workers and are thought to have good knowledge about the issue. Meanwhile, gate three had better performance as the enforcement was implemented to a better extent**.**

There was an overall proper social distancing rate of 77.3% at all the gates. This result was much higher than other studies done in Ethiopia where the practice ranges from 22 to 33.6%.(8, 11, 12)This could be greatly attributed to the restriction in the number of attendants per patient, labeling of gates based on their use, use of phone clinics and longer appointment to decrease non-critical hospital visits. Due to these measures number of people entering the gates decreased from 20000 to 7000.

However, there was crowding of people around areas of service provision such as, the information desk, thermal screening section and hand washing basins. Looking at the graphs, there was no significant variation throughout the study as that of the other studies, supporting the above possible explanation. Regardless, the lack of enforcement and even worse looking crowding just outside the gate should not be ignored.

Similarly, better face masking was found (86.9%) than a study done in Addis Zemen Hospital (36.6%) while it was lower than a study done in China where nearly all the participants (98.0%) wore masks.(11) This could be due to the mandating of universal masking by the government. However, it was not satisfactory as some people entered with no mask or using scarves as one.

The strength of this study is it is the first study which assessed the progressive practice of preventive methods of COVID using weekly cross-sectional survey. There were some limitations. The study did not assess associated factors for the practice and discussion of the results were difficult as there are only few studies done in Ethiopia.

Conclusion and Recommendation

There was an overall good practice of social distancing and mask usage. On the contrary, hand hygiene practice was remarkably low. Enforcement issues and shortage of infrastructures were key areas to be improved.

We recommend giving attention to and improving the hand hygiene practices by increasing provision of water and soap facilities close to the Gates. Moreover, placement of printed posters that help raise awareness about handwashing at the columns of the Gates can be supplementary. Giving comprehensive and organized training for the security guards and support staffs working on the gate is another essential step. Lastly, regular supervision and feedback regarding the enforcement of preventive measures is to be highly emphasized on to ensure the sustainability of the efforts made.

ACKNOWLEDGMENT

We would like to thank the management of College of Health Sciences, Addis Ababa University for extending their help in our needs.

Conflict of Interest: There is no conflict of interest for this study to report.

Funding: No funding has been entailed for the entirety of the study.

REFERENCE

1. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet. 2020;395 (10223):507-13.
2. Harrison AG, Lin T, Wang P. Mechanisms of SARS-CoV-2 Transmission and Pathogenesis. Trends Im munol. 2020 Dec;41(12):1100-1115. doi: 10.1016/j.it.2020.10.004. Epub 2020 Oct 14. PMID: 33132005; PMCID: PMC7556779.
3. Organization WH. Global surveillance for COVID-19 disease caused by human infection with novel coro navirus (COVID-19): interim guidance 2020 [updated 2020, February 27. Available from: https:// apps.who.int/iris/handle/10665/331231.(Accessed 22 August 2020).
4. Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU) [Internet]. 2020, August 22. Available from: https://coronavirus.jhu.edu/map.html.(Accessed 22 August 2020).
5. A O. Ethiopia's unconventional COVID-19 response 2020, June 05 [Available from: https:// www.weforum.org/agenda/2020/06/ethiopia-covid19-response/.(Accessed 22 August 2020).

6. Hospital EOCEoTAS. Emergency Preparedness Plan. In: Hospital TAS, editor. 2020, August 16.
7. Hospital EOCEoTAS. Covid-19 Epidemiologic Bulletin. 2020, August.
8. Jemal B AZaMS, et al. Knowledge, attitude and practice of healthcare workers towards COVID-19 and its prevention in Ethiopia: a multicenter study. 2020, May (Accessed 26 August 2020).
9. Organization WH. Overview of Public Health and Social Measures in the context of COVID-19 2020, May 18 [Available from: https://www.who.int/publications/i/item/overview-of-public-health-and-social-measures-in-the-context-of-covid-19.(Accessed 22 August 2020).
10. Organization WH. World Health Organization & WHO Patient Safety. (2009). WHO guidelines on hand hygiene in health care. World Health Organization 2009, January [WHO/IER/PSP/2009/01262 p]. Avail able from: https://apps.who.int/iris/handle/10665/44102.(Accessed June 15, 2020).
11. Akalu Y, Ayelign B, Molla MD. Knowledge, Attitude and Practice Towards COVID-19 Among Chronic Disease Patients at Addis Zemen Hospital, Northwest Ethiopia. Infect Drug Resist. 2020;13:1949-60.
12. Kebede Y, Yitayih Y, Birhanu Z, Mekonen S, Ambelu A. Knowledge, perceptions and preventive prac tices towards COVID-19 early in the outbreak among Jimma university medical center visitors, Southwest Ethiopia. PLOS ONE. 2020;15(5):e0233744.