

Compliance with COVID-19 Preventive and Control Measures among Food and Drink Establishments in Bench-Sheko and West-Omo Zones, Ethiopia, 2020

This article was published in the following Dove Press journal:
International Journal of General Medicine

Qaro Qanche Kayrite¹
Adane Asefa Hailu¹
Tadesse Nigussie Tola¹
Tadesse Duguma Adula²
Shewangizaw Hailemariam
Lambyo³

¹Department of Public Health, College of Health Science, Mizan-Tepi University, Mizan Aman, Ethiopia; ²Department of Medical Laboratory, College of Health Science, Mizan-Tepi University, Mizan Aman, Ethiopia; ³Department of Midwifery, College of Health Science, Mizan-Tepi University, Mizan Aman, Ethiopia

Introduction: Despite the implementation of many preventive and control systems developed by governments, the spread of COVID-19 and its resulting infection rate are alarmingly increasing from time to time all over the world. In Ethiopia, public places visited by large numbers of people where preventive and control measures are poorly practiced are considered to be potentially contributing to the spread of the disease. Food and drink establishments are among the highly susceptible public establishments visited by large numbers of people who interact among themselves and with employees. Hence, this study aimed to measure the compliance with COVID-19 preventive and control measures among food and drink establishments in the selected towns of Bench-Sheko and West-Omo Zones in Ethiopia.

Methods: A cross-sectional study was conducted among food and drink establishments in selected towns of Bench-Sheko and West-Omo zones from May 15, 2020 to June 15, 2020. A census of all 324 food and drink establishments found in the study area was conducted, and data were obtained from managers of the establishments through face-to-face interviews. Data were entered in to Epidata manager and exported to SPSS version 24.0 for analysis. Percentage compliance score was computed to describe the level of compliance. Ethical approval was obtained from Mizan-Tepi University Institutional Review Board, and written informed consent was obtained from every participant.

Results: The overall compliance level with COVID-19 preventive and control measures was 55.5%. The majority (89%) of the food and drink establishments had functional hand washing facilities at the main entrance gate. Less than half of the food and drink establishments had posted written materials promoting hand washing, arranged tables and chairs in a manner that they accommodate not more than four people at once and at least 2 meters apart, carry out daily cleaning and disinfection of frequented touched surfaces, and provided education or training for their workers about COVID-19.

Conclusion: The overall compliance level with COVID-19 preventive and control measures among food and drink establishments was very poor. Thus, it is highly recommended that the federal government of Ethiopia, the federal ministry of health, and local health authorities consider a move towards more solid, strict, and comprehensive compulsory measures, including fines that can lead up to the closure of non-compliant establishments.

Keywords: compliance, COVID-19, preventive and control measures, food and drink establishments

Introduction

Coronavirus disease-2019 (COVID-19) is a newly emerged disease caused by a highly infectious novel coronavirus which primarily affects the respiratory

Correspondence: Qaro Qanche Kayrite
Tel +251 916401623
Email qaroqanche@gmail.com

system. It was first seen in the Hubei province of China in December 2019.¹ The disease has been recognized as a global public health emergency by the World Health Organization (WHO) on March 11, 2020 after cases had started to be seen outside China in less than a two-month period.² On March 13, 2020, the Federal Ministry of Health of Ethiopia has confirmed a COVID-19 case in the capital, Addis Ababa, which was the first case to be reported in Ethiopia since the beginning of the outbreak.¹

The disease is clinically manifested by fever, cough, difficulty breathing, and other flu-like signs and symptoms including runny and stuffy nose, sneezing, and sore throat. In most of the cases, the disease shows mild to moderate manifestations, but it can lead to adverse outcomes including severe complications and/or death in some vulnerable individuals such as the elderly and those having underlying medical conditions.³

According to current evidence, COVID-19 virus is transmitted between people through respiratory droplets (particularly when coughing). Direct contact with an infected person or indirect contact, (touching a surface or object that has been contaminated with respiratory secretions) and then touching one's own mouth, nose, or eyes is another route of transmission.⁴

Evidence from different sources indicate that asymptomatic infection and transmission of COVID-19 is possible. Asymptomatic infection occurs when an individual is infected but experiences no symptoms, while asymptomatic transmission occurs when an infected individual without symptoms transmits the virus to another person.⁵

Evidence of asymptomatic COVID-19 infection has been reported in several studies that a substantial portion of COVID-19 patients remained asymptomatic at the end of their isolation period.^{6–11} With regard to asymptomatic transmission, there is some evidence of transmission from people who are asymptomatic and never develop symptoms,^{12–15} and more evidence of transmission from people who are in their incubation period (ie, people who transmit infection while asymptomatic, but prior to their development of symptoms).^{6,12,16–21}

These evidences imply that in countries like Ethiopia, where the capacity to conduct mass testing is lacking and contact tracing is not very effective, asymptomatic and pre-symptomatic cases act as silent spreaders and this underlines the importance of social distancing, regular hand washing and good hygiene, and mask wearing to be practiced primarily among the general public.

In the absence of an effective vaccination, measures such as active case finding and isolation, quarantine, travel restrictions, and the promotion of individual protection behaviors such as frequent hand washing, wearing of face masks, respiratory hygiene, avoiding public gatherings and physical distancing are the selected measures for controlling the COVID-19 pandemic.²²

Food and drink establishments such as hotels, pensions, restaurants, and cafeterias are as highly susceptible to COVID-19 as other public establishments visited by large numbers of people who interact among themselves and with employees. They are places where guests stay temporarily in close cohabitation and where there is a high degree of interaction among guests and workers.³

These critical issues are not only related to hotels, restaurants, and cafeterias. In fact, also the traditional food production chains (like, for example, the wheat and cereal mills)^{23,24} and the industrial bakeries^{25–27} and the innovative food production chains (eg, the production chains of insects as food)^{28,29} have to face the critical issues related to workers and guests interactions, without the possibility to interrupt the working activity since they produce essential commodities. Moreover, as highlighted by Cappelli and Cini, 2020,³⁰ the spread of the COVID-19 pandemic led to a big challenge for the food industry, in particular for short food supply chains and local productions.

It is these aspects and the interactions specific to these establishments (guest-guest, guest-staff, and staff-staff) that require specific attention, every staff member and customer must strictly comply with the basic protective measures against COVID-19 recommended by the WHO.³¹

Food and drink establishments are required to strictly follow their staff health, sanitary measures, and correct use of personnel protective equipment during work, applying rigorous visitor/customer policies. Cleaning and disinfection of frequent and high touch points with approved chemicals and sanitizers with defined frequencies and practicing social distancing and employee optimization during shifts can be helpful in preventing the spread of coronavirus.³²

Ethiopia, being one of the developing countries trying to address the diverse needs of its people, is currently fighting the battle against the pandemic. The government is showing high commitment to contain it before it causes significant damage to the community and to the country. Case identification, contact tracing, isolation, and quarantine are the

actions being taken to contain the spread of the disease in addition to the preventive measures used to promote social distancing and sanitary measures.³³

To this end, the government of Ethiopia has been taking different measures including the declaration of a state of emergency, educating the public through all the possible channels of communication, developing guidelines for different stakeholders to make the fight against the pandemic uniform, closing/lockdown of some institutions where overcrowding is highly likely, and strict restrictions on other establishments like the food and drink establishments.³⁴ The WHO guideline and the declaration of the state of emergency in Ethiopia requires food and drink establishments like hotels, restaurants, and cafeterias among others to continue providing service to their customers but follow strict precautionary measures.^{4,34}

Despite all these efforts put forth by the government, the compliance of the public and different institutions to the recommendations to halt the spread of the disease is observed to be very low and inadequate. Moreover, there is no empirical evidence so far in Ethiopia or elsewhere showing the level of compliance to these recommendations.

Therefore, the main aim of this study is to measure the level of compliance with COVID-19 preventive and control measures among food and drink establishments in selected towns of Bench-Sheko and West-Omo zones in Ethiopia.

Findings from this study will serve as an input for making informed decisions by the federal, regional and local health authorities and other concerned stakeholders and will help them to take prompt interventions to fight against the pandemic and bring it under control before it causes significant and wide-ranging harm to the country.

Methods

Study Area and Period

This study was conducted among hotels, restaurants, and cafeterias in Mizan-Aman, Sheko, Guraferda, Shey Bench, Jemu, Tum, and Maji towns of Bench-Sheko and West-Omo Zones from May 15 to June 15, 2020. Bench-Sheko zone is one of the zonal administrations in the South Nations, Nationalities and Peoples Region of Ethiopia. It is located at about a distance of 585 km to the southwest of Addis Ababa. Mizan-Aman town is the administrative center of Bench-Sheko zone. In Mizan-Aman town, there are 25 hotels, 72 restaurants, and 15 cafeterias. In Sheko, Guraferda, and Shey Bench towns, there are 29, 23, and 28 food and drink establishments, respectively.

West-Omo zone is one of the zonal administrations in the South Nations, Nationalities and Peoples Region of Ethiopia. Jemu town is the administrative center of West-Omo zone. It is located at about a distance of 625 km to the southwest of Addis Ababa. In Jemu town, there are 7 hotels, 64 restaurants, and 15 cafeterias. In Tum and Maji towns, there are 14 and 39 food and drink establishments, respectively.

Generally, there were 324 hotels, restaurants, and cafeterias, altogether, in Bench-Sheko and West-Omo Zones.

Study Design, Population, and Sample Size

A facility-based cross-sectional study design was employed. All hotels, restaurants and cafeterias in the study areas were the source and study population for this study. Study units were managers of the establishments or any equivalent body who was able to provide the relevant information. All the 324 hotels, restaurants, and cafeterias in the selected towns were included in this study.

Sampling Technique and Procedure

A census of all the hotels, restaurants, and cafeterias were included (Figure 1). After selecting an establishment, a manager or other equivalent body who can provide complete information for the purpose of this study was interviewed. In cases when that person is not available during the visit to the establishment, a second visit was made. If he/she is not available during the second visit, that establishment was recorded as non-response.

Data Collection Technique and Tool

The data was collected through face-to-face interview using a structured questionnaire developed by the investigators after reviewing different COVID-19 guidelines and other sources. The questionnaire was composed of two parts. The first part contained questions about the socio-demographic characteristics of respondents (ie, managers of the establishments) and the second part contained questions that were used to assess compliance of the establishments which consisted of 12 items with 'yes' or 'no' response options.

Variables

- Socio-demographic variables of respondent (age, sex, religion, educational level, etc.).
- Type of facility.
- Compliance level.

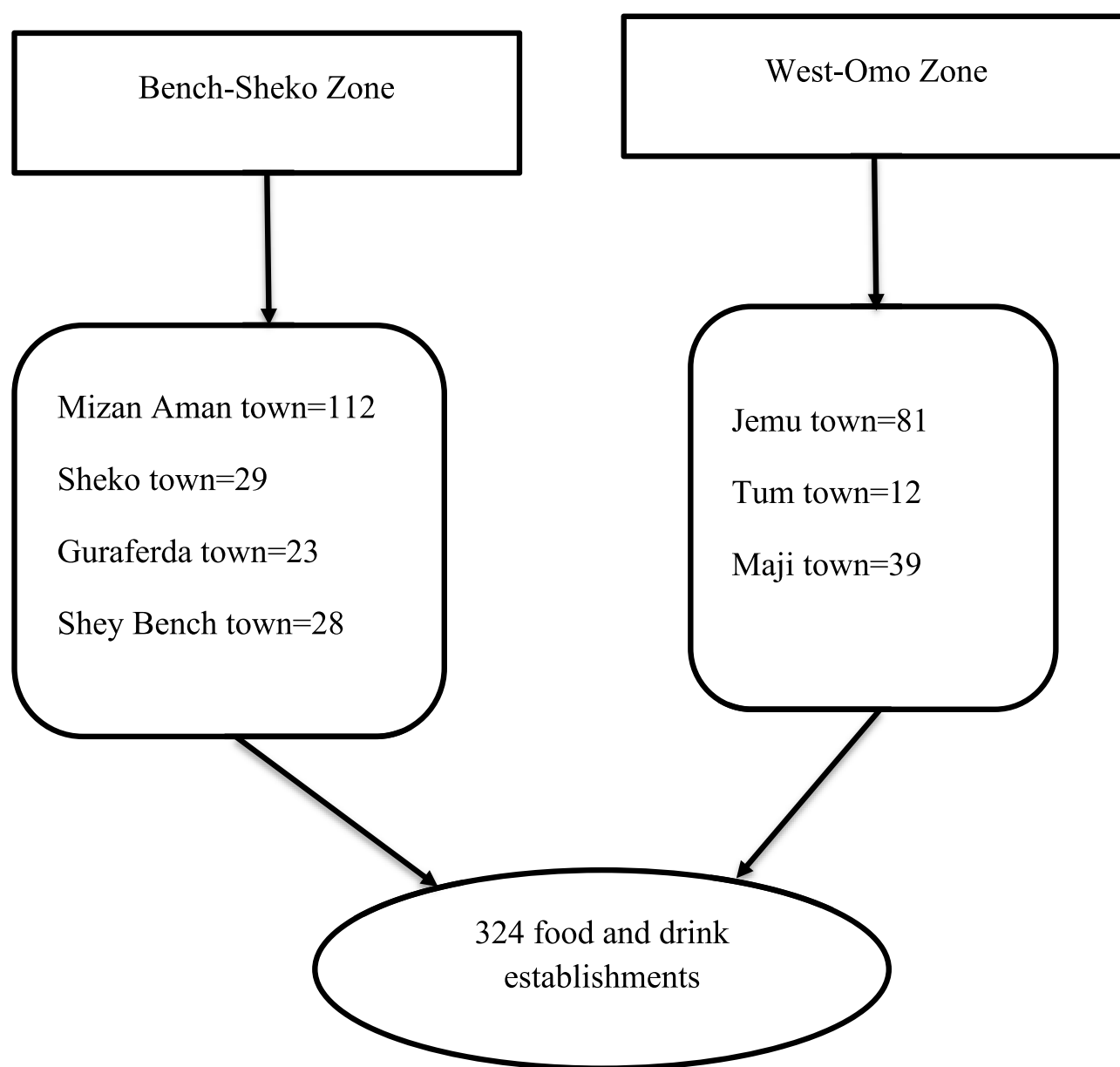


Figure 1 Schematic presentation of sampling procedure of food and drink establishments in Bench-Sheko and West-Omo Zones, Ethiopia, 2020

Measurement

Compliance

Indicates conformity in fulfilling official requirements. In this study compliance with COVID-19 prevention and control measures was measured by using 12 items with 'Yes' or 'No' response options. A score of '1' was given for 'Yes' and '0' for 'No' responses. 'Yes' indicates compliance with the item under consideration and 'No' indicates non-compliance. The possible sum score for each establishment ranges from 0–12. A mean compliance score for each establishment was computed by dividing the sum score by the number of items. Finally, an overall

percentage compliance score was measured by the following formula, which indicates level of compliance of the food and drink establishments towards COVID-19 preventive and control measures in the study area.

$$\% \text{ compliance score} = \frac{\text{sum of mean compliance scores}}{\text{Sample size}} \times 100$$

Higher percentage compliance scores indicate good compliance, whereas lower scores indicate poor compliance towards COVID-19 preventive and control measures.

Data Quality Assurance

A one-day training was given for data collectors and supervisors to create a common understanding of the objective of the study and the tool. A pre-test was conducted outside the study area and necessary corrections were made to the tool. The filled questionnaire was checked for consistency and completeness by the supervisors on daily basis. Data entry was carefully done by the investigators using Epidata manager to minimize and control errors during data entry.

Data Analysis

The collected data was entered in to Epidata manager and exported to SPSS version 24.0 for analysis. Cronbach's alpha of the items assessing compliance level was calculated to check the internal consistency of the tool. Percentage compliance scores were computed and described for each item.

Ethics Approval and Consent to Participate

Ethical approval was obtained from Mizan-Tepi University Institutional Review Board prior to the commencement of the study and written informed consent has been obtained from every participant during the data collection time.

All the participants have been informed about the aims of the research and their anonymity was assured. The participants had been informed that the information they provide will be kept confidential and that there were no risks associated with their participation in the study. Their participation was entirely voluntary and they have been told that they have the right to opt out any time they wanted to do so.

All the study participants were 18 years old and above. As a result, there was no need to obtain informed consent from a parent or a guardian.

Results

Sociodemographic Characteristics of Respondents

From the total sample of 324, 315 managers of food and drink establishments participated in this study, yielding a response rate of 97%. Hotels and restaurants accounted for 74.6% of the establishments. The mean age of respondents was 29.4 and about 62% of the respondents were in the age range of 25–40 years. A majority of the respondents were males and Orthodox religion accounted for 60% of the respondents. 37%, 36%, and 21% of the respondents had attended primary, secondary, and college or higher education, respectively (Table 1).

Table 1 Sociodemographic Characteristics of Managers of Food and Drink Establishments in Bench-Sheko and West-Omo Zones, Ethiopia, 2020

Variables	Category	Frequency (%) (n = 315)
Age	18–24	90(28.6)
	25–40	194(61.6)
	41–65	31(9.8)
Sex	Male	210(66.7)
	Female	105(33.3)
Religion	Orthodox	189(60.0)
	Muslim	47(14.9)
	Protestant	79(25.1)
Ethnicity	Bench	28(8.9)
	Sheko	16(5.1)
	Kaffa	85(27.0)
	Oromo	37(11.7)
	Amhara	94(29.8)
	Tigre	9(2.9)
	Other	46(14.6)
Marital status	Single	129(41.0)
	Married	186(59.0)
Educational status	No formal education	16(5.1)
	Primary education	117(37.1)
	Secondary education	115(36.6)
	College or higher	67(21.3)
Type of establishment	Hotel	121(38.4)
	Restaurant	114(36.2)
	Cafeteria	74(23.5)
	Others	6(1.9)

Compliance with COVID-19 Preventive and Control Measures

The findings of this study revealed that the overall compliance level towards COVID-19 preventive and control measures among food and drink establishments was 55.5%. The face-to-face interview with managers of the establishments revealed that a majority (89%) of the food and drink establishments had functional hand washing facility at the main entrance gate and 77% of them reported that water and soap was made available at all the times. Less than half of the establishments had posted written materials promoting hand washing next to the hand washing facility and arranged their tables and chairs in a manner that does not accommodate more than four people at once and at least 2 meters apart. Daily cleaning

and disinfection of frequently touched surfaces such as tables, chairs, menus, stair bars, doorknobs, switches, and lift buttons by a bleach or alcohol-based sanitizer was performed in less than half of the establishments. In nearly two-thirds of the establishments, food handlers and waiters practiced cleaning their hands by soap and water or alcohol-based hand rub after each touch of money, surfaces, or used utensils. Moreover, only 41% of the establishments had provided education or training for their workers on COVID-19 (Table 2).

Discussion

The finding of this study revealed that the overall compliance level toward COVID-19 preventive and control measures among food and drink establishments was 55.5%. This is a very poor compliance level because strict high-level compliance is required to prevent and control the COVID-19 pandemic. The possible reason for this low compliance level may be due to fatigue and reluctance from the establishments' side and inadequate enforcement of the COVID-19 preventive and control measures from the concerned government authorities' side.

The majority of the establishments provided hand washing facility at their main entrance gate but about one-fourth of them failed to avail water and soap all the time. Different guidelines developed by different groups of food safety experts requires food and drink service providing facilities to promote frequent hand washing by placing hand washing facilities with water and soap made available all the time so that food handlers, staff workers, and clients/customers coming to the facility can practice frequent hand washing.^{32,35,36} According to the Food Safety and COVID-19 Precautionary Measures to Limit the Spread of Coronavirus at Food Service and Retail Sector, keeping the health and wellbeing of customers should be the top priority for food businesses. Food service businesses should increase the number of hand-sanitizer dispensers at entrances and in the waiting areas of their restaurants.³⁶

Less than half of the food and drink establishments displayed written material promoting hand washing next to the hand washing facility or in any visible place in the compound. This is extremely far from the required level as emphasized by the General Guidance for Businesses and Other Non-Health Care Settings developed by New York City Health Department. This guideline stresses the need to promote hand hygiene and other preventive measures through printing and posting flyers.³⁵ Another guideline by

the WHO states the need to display posters promoting hand-washing and respiratory hygiene. And these things should be combined with other communication measures such as offering guidance from occupational health and safety officers, briefing at meetings, and information on the intranet, etc.³⁷

In more than half of the establishments, tables and chairs are not arranged at a distance of at least two meters apart and they accommodate more than four people at once. This is, again, not in compliance with COVID-19 guidelines. Recommendations by the CDC, WHO, as well as food safety authorities emphasize keeping a space of at least two meters between individuals to halt the spread of the pandemic.^{32,37}

Moreover, less than half of the establishments perform daily cleaning and disinfection of frequently touched surfaces such as tables, chairs, menus, stair bars, doorknobs, switches, and lift buttons by appropriate sanitizers. This practice is grossly far below the recommendations of COVID-19 guidelines which states that surfaces (eg desks and tables) and objects (eg telephones, keyboards) need to be wiped with disinfectant regularly. This is highly recommended because contamination on surfaces touched by employees and customers is one of the ways to contract COVID-19.^{32,35–37}

Less than one in ten establishments provide face masks for food handlers and waiters to be worn during their regular working hours and shift changes. This is the worst practice as food handlers and staff workers that handle raw food and work in food production or manufacturing areas should use appropriate protective clothing, gloves, masks, hairnets, and should wash their hands frequently, to avoid touching their face, mouth, eyes, and nose to avoid the spread of coronavirus.³²

Furthermore, in less than half of the establishments the management staff provides education or training for all workers on COVID-19 and how to prevent it. This is also inadequate practice as COVID-19 guidelines recommend communication measures such as offering guidance from occupational health and safety officers, briefings at meetings, and information on the intranet to promote hand-washing and other preventive information.³⁷ Another guideline calls for food facilities to have staff members who can provide training and education to employees and visitors.³² Operational considerations for COVID-19 management in the accommodation sector, an interim guidance developed by the WHO, states that management of food and drink establishments should inform all staff about the

Table 2 Compliance with COVID-19 Preventive and Control Measures Among Food and Drink Establishments in Bench-Sheko and West-Omo Zones, Ethiopia, 2020

Compliance Items		Percentage (n = 315)
Presence of functional hand washing facility at the main entrance gate	Yes No	89.5 10.5
Presence of water and soap at all the time	Yes Yes	77.1 22.9
Presence of written material promoting hand washing posted next to the hand washing facility	Yes No	41.6 58.4
Presence of posters or written materials displayed at various corners of the establishment promoting hand washing, respiratory hygiene, and physical distancing	Yes No	34.6 65.4
Arrangement of tables and chairs in a way that they accommodate not more than four (4) people at once	Yes No	49.2 50.8
Arrangement of tables and chairs in a manner that the distance from the back of one chair to the back of another chair be at least 2 meters apart	Yes No	41.0 59.0
Frequently touched surfaces such as tables, chairs, menus, stair bars, doorknobs, switches, and lift buttons are daily cleaned and disinfected by a sanitizer	Yes No	48.9 51.0
Adequate ventilation (ie opening windows and installing AC ventilators) is ensured in areas of potential gathering such as corridors, staff work rooms, and dining/customer serving rooms	Yes No	52.1 47.9
Cleaning of utensils (dishes, cups, spoons ...) well by plenty of running water and soap before serving	Yes No	71.4 28.6
Food handlers and waiters clean their hands by soap and water or alcohol-based hand rub after each touch of money, surfaces or used utensils	Yes No	64.4 35.6
Food handlers and waiters are provided with face masks to be worn during their regular working hours and shift changes	Yes No	8.2 91.8
Management of the establishment provided education or training for all workers on COVID-19 and how to prevent it	Yes No	41.0 59.0

Note: Cronbach's alpha = 72.6%.

measures to be adopted and the measures that could protect their health and that of others, including the recommendation to stay home and seek medical attention if they have respiratory symptoms. The management should organize information briefings that should cover all the basic protective measures against COVID-19 and the signs and symptoms of the disease.⁴

Limitations

The information for this study was obtained from the managers who were, in most of the cases, owners of the food and drink establishments. This may have resulted in social desirability bias. Therefore, the results of this study need to be used cautiously in light of this limitation. However, this limitation was attempted to be minimized

through observing observable compliance dimensions right after the interview and the responses were corrected as necessary.

Moreover, the lack of previous studies on compliance with COVID-19 prevention and control measures in different settings made the discussion of this study only limited to the available guidelines which are circular in nature. This may have compromised the comparability and generalizability of the findings and readers need to be cautious of this limitation.

Conclusion

The overall compliance level towards COVID-19 preventive and control measures among food and drink establishments was very poor. Thus, it is highly recommended that

all the concerned local authorities should design and enforce specific strategies that could encourage food and drink establishments to comply to COVID-19 preventive and control measures in order to safeguard the public at large.

Local health authorities in collaboration with other concerned stakeholders should employ a compulsory mechanism to monitor the implementation of all the preventive and control measures by the establishments. They should consider interventions with fines that can lead up to the closure for those that do not comply with the anti-COVID rules.

In general, the federal government of Ethiopia and the federal ministry of health should consider a move towards more solid, strict, and comprehensive compulsory measures to be implemented in all aspects, in general, and in the food and drinking establishments in particular to get the pandemic under control.

Acknowledgments

The authors would like to thank Mizan Tepi University College of Health Science for its kind cooperation in providing stationery materials and duplications of the questionnaire. The authors would also like to express their gratitude to Bench-Sheko and West-Omo Zones Health Departments for their genuine cooperation during the fieldwork without whose help the completion of this study would not have been realized.

Disclosure

The authors declare that they have no competing interests.

References

1. WHO Regional Office for Africa. First case of covid-19 confirmed in ethiopia. WHO. Regional Office for Africa [Internet]. World Health Organization. 2020. Available from: <https://www.afro.who.int/news/first-case-covid-19-confirmed-ethiopia>.
2. Hauck G, Gelles K, Bravo V, Mitchell Thorson UT Five months in: A timeline of how COVID-19 has unfolded in the US [Internet]. New England Journal of Medicine. 2020. Available from: https://www.usatoday.com/in-depth/news/nation/2020/04/21/coronavirus-updates-how-covid-19-unfolded-u-s-timeline/2990956001/?utm_source=feedblitz&utm_medium=FeedBlitzRss&utm_campaign=usaday-newstopstories.
3. Multnomah County Health Department. COVID19 Cleaning & Sanitizing Guidelines for Restaurants & Food Service [Internet]; 2020. Available from: <https://multco.us/covid-19-cleaning-and-sanitizing-guidelines-restaurants-food-service>.
4. World Health Organization. Operational considerations for COVID-19 management in the accommodation sector [Internet]; 2020. Available from: <https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/technical-guidance/2020/operational-considerations-for-covid-19-management-in-the-accommodation-sector-interim-guidance,-31-march-2020>.
5. Public Health Ontario. COVID-19 – what We Know So Far A bout Asymptomatic Infection and Asymptomatic Transmission. Toronto, ON: Queen's Printer for Ontario; 2020.
6. Zhou R, Li F, Chen F, et al. Viral dynamics in asymptomatic patients with COVID-19. *Int J Infect Dis.* 2020;96:288–290. doi:10.1016/j.ijid.2020.05.030
7. Breslin N, Baptiste C, Gyamfi-Bannerman C, et al. Coronavirus disease 2019 infection among asymptomatic and symptomatic pregnant women: two weeks of confirmed presentations to an affiliated pair of New York City hospitals. *Am J Obstet Gynecol MFM.* 2020;2(2): 100118.
8. Sutton D, Fuchs K, D'Alton M, Goffman D. Universal screening for SARS-CoV-2 in women admitted for delivery. *N Engl J Med.* 2020;382(22):2163–2164. doi:10.1056/NEJMc2009316
9. Dora AV, Winnett A, Jatt LP, et al. Universal and serial laboratory testing for SARS-CoV-2 at a long-term care skilled nursing facility for veterans — los Angeles, California, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(21):651–655. doi:10.15585/mmwr.mm6921e1
10. Kimball A, Hatfield KM, Arons M, et al. Asymptomatic and pre-symptomatic SARS-CoV-2 infections in residents of a long-term care skilled nursing facility — king County, Washington, March 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(13):377–381. doi:10.15585/mmwr.mm6913e1
11. Wong J, Abdul Aziz ABZ, Chaw L, et al. High proportion of asymptomatic and presymptomatic COVID-19 infections in air passengers to Brunei. *J Travel Med.* 2020;27(5):1–2. doi:10.1093/jtm/taaa066
12. Arons MM, Hatfield KM, Reddy SC, et al. Presymptomatic SARS-CoV-2 infections and transmission in a skilled nursing facility. *N Engl J Med.* 2020;382(22):2081–2090. doi:10.1056/NEJMoa2008457
13. Bai Y, Yao L, Wei T, et al. Presumed asymptomatic carrier transmission of COVID-19. *JAMA.* 2020;323(14):1406–1407. doi:10.1001/jama.2020.2565
14. Zhang J, Tian S, Lou J, Chen Y. Familial cluster of COVID-19 infection from an asymptomatic. *Crit Care.* 2020;24(1):7–9. doi:10.1186/s13054-020-2817-7
15. Zhou J, Tan Y, Li D, He X, Yuan T, Long Y. Observation and analysis of 26 cases of asymptomatic SARS-COV2 infection. *J Infect.* 2020;81(1):e69–70.
16. He X, Lau EHY, Wu P, et al. Temporal dynamics in viral shedding and transmissibility of COVID-19. *Nat Med.* 2020;26(5):672–675. doi:10.1038/s41591-020-0869-5
17. Cheng HY, Jian SW, Liu DP, Ng TC, Huang WT, Lin HH. Contact tracing assessment of COVID-19 transmission dynamics in taiwan and risk at different exposure periods before and after symptom onset. *JAMA Intern Med.* 2020;180(9):1156–1163. doi:10.1001/jamainternmed.2020.2020
18. Böhmer MM, Buchholz U, Corman VM, et al. Investigation of a COVID-19 outbreak in Germany resulting from a single travel-associated primary case: a case series. *Lancet Infect Dis.* 2020;20(8):920–928. doi:10.1016/S1473-3099(20)30314-5
19. Rothe C, Schunk M, Sothmann P, et al. Transmission of 2019-NCoV infection from an asymptomatic contact in Germany. *N Engl J Med.* 2020;382(10):970–971.
20. Jang S, Han SH, Rhee JY. Cluster of coronavirus disease associated with fitness dance classes, South Korea. *Emerg Infect Dis.* 2020;26(8):1917–1920. doi:10.3201/eid2608.200633
21. Hijnen D, Marzano AV, Eyerich K, et al. SARS-CoV-2 transmission from presymptomatic meeting attendee, Germany. *Emerg Infect Dis.* 2020;26(8):1935–1937. doi:10.3201/eid2608.201235
22. European Centre for Disease Prevention and Control. Coronavirus disease 2019 (COVID-19) in the EU/ EEA and the UK – tenth update [Internet]. 2020. Available from: <https://www.ecdc.europa.eu/en/publications-data/rapid-risk-assessment-coronavirus-disease-2019-covid-19-pandemic-tenth-update>.

23. Cappelli A, Oliva N, Cini E. Stone milling versus roller milling: a systematic review of the effects on wheat flour quality, dough rheology, and bread characteristics. *Trends Food Sci Tech.* 2020;97:147–155. doi:10.1016/j.tifs.2020.01.008
24. Cappelli A, Mugnaini M, Cini E. Improving roller milling technology using the break, sizing, and reduction systems for flour differentiation. *LWT.* 2020;133:110067. doi:10.1016/j.lwt.2020.110067
25. Cappelli A, Guerrini L, Cini E, Parenti A. Improving whole wheat dough tenacity and extensibility: a new kneading process. *J Cereal Sci.* 2019;90:102852. doi:10.1016/j.jcs.2019.102852
26. Cappelli A, Bettaccini L, Cini E. The kneading process: a systematic review of the effects on dough rheology and resulting bread characteristics, including improvement strategies. *Trends Food Sci Tech.* 2020;104:91–101. doi:10.1016/j.tifs.2020.08.008
27. Cappelli A, Canessa J, Cini E. Effects of CO₂ snow addition during kneading on thermoregulation, dough rheological properties, and bread characteristics: a focus on ancient and modern wheat cultivars. *Int J Refrig.* 2020;117:52–60.
28. Cappelli A, Cini E, Lorini C, Oliva N, Bonaccorsi G. Insects as food: a review on risks assessments of Tenebrionidae and Gryllidae in relation to a first machines and plants development. *Food Control.* 2020;108:106877. doi:10.1016/j.foodcont.2019.106877
29. Cappelli A, Oliva N, Bonaccorsi G, Lorini C, Cini E. Assessment of the rheological properties and bread characteristics obtained by innovative protein sources (*Cicer arietinum*, *Acheta domesticus*, *Tenebrio molitor*): novel food or potential improvers for wheat flour? *LWT.* 2020;118:108867. doi:10.1016/j.lwt.2019.108867
30. Cappelli A, Cini E. Will the COVID-19 pandemic make us reconsider the relevance of short food supply chains and local productions? Trends in food science and technology. *Trends. Food Sci Tech.* 2020;99(May):566–567.
31. WHO. Operational considerations for COVID-19 management in the accommodation sector. 2008. 2020.
32. Shahbaz M, Bilal M, Akhlaq M, Moiz A, Zubair S, Hafiz M.N. I. Strategic measures for food processing and manufacturing facilities to combat coronavirus pandemic. *J Pure Appl Microbiol.* 2020;14(2):1087–1094. doi:10.22207/JPAM.14.2.01
33. Federal Ministry of Health (Ethiopia). National comprehensive covid19 management handbook [Internet]; 2020
34. The Federal Government of Ethiopia. A state of emergency proclamation enacted to counter and control the spread of covid-19 and mitigate its impact [Internet]. 2020. Available from: https://www.hopr.gov.et/documents/portlet_file_entry/20181/A+State+of+Emergency+Proclamation+Enacted+to+Counter+and+Control+the+Spread+of+COVID-19.pdf/ec884bba-3221-49e8-9992-26ccb385462?download=true.
35. NYC Health Department. General guidance for businesses and other non-health care settings [Internet]. 2020. Available from: nyc.gov/health/coronavirus.
36. Shahbaz M, Bilal M, Moiz A, Shagufta Zubair HMNI. Food safety and COVID-19: precautionary measures to limit the spread of coronavirus at food service and retail sector. *J Pure Appl Microbiol.* 2020;14.
37. World Health Organization. Getting your workplace ready for COVID-19 [Internet]; 2020. Available from: <https://apps.who.int/iris/handle/10665/331584>.

International Journal of General Medicine

Publish your work in this journal

The International Journal of General Medicine is an international, peer-reviewed open-access journal that focuses on general and internal medicine, pathogenesis, epidemiology, diagnosis, monitoring and treatment protocols. The journal is characterized by the rapid reporting of reviews, original research and clinical studies

Submit your manuscript here: <https://www.dovepress.com/international-journal-of-general-medicine-journal>

Dovepress

across all disease areas. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.