



Socio-Economic Implications of COVID-19 Prevention and Control Measures in Addis-Ababa, Ethiopia: A Cross-Sectional Study Design

Getachew Weldeyohannes¹, Alemu Kibret¹, Ephrem Mamo¹, Getabalew Endazenaw Bekele^{1,*}, Aman Yesuf², Trhas Tadesse¹

¹Yekatit 12 Hospitals, Department of Public Health, College of Medicine, Addis Ababa, Ethiopia

²Department of Public Health, St. Paul Mellenium Medical College, Addis-Ababa, Ethiopia

Email address:

eyobgetabalew@gmail.com (Getabalew Endazenaw Bekele)

*Corresponding author

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Abstract: Several African countries have reacted quickly and decisively to curb the potential influx and spread of the COVID-19 virus very much in line with emerging international experience. The aim of this study was to assess the socio-economic Implications of COVID-19 prevention and control measures in Addis-Ababa, Ethiopia. A quantitative study method was applied to address the objectives of the study. The study used cross-sectional study design using community based approaches as appropriate as possible to address the specific objectives. The data was collected using interviewer administered structured questionnaire. A total of 634 participants were selected from each stratum. In each stratum a systematic random sampling techniques were applied. Descriptive analysis using frequency, percentages, cross-tabulations and figures were performed to summarize and present the data. Binary logistic regression analysis was used to identify variables that are significant with the outcome variable at p value ≤ 0.20 and those variables were considered for the final model. In this study more than half of study participants 337 (53.2%) and 325 (51.3%) reported that economic and social challenges were imposed on them as a result of adherence to CCOVID-19 prevention and Control respectively. Factors that were associated with economic and social implications of COVID-19 preventive and control measures include age marital status, monthly income social distancing practice and smoking. In conclusion, more than half of the study participants were faced both economic and social problems as result of practicing COVID-19 prevention and controlling measures.

Keywords: Social Implications, Economic Implications, Prevention and Control

1. Introduction

Since its emergence in December, 2019, the coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has progressed into a pandemic [1] with over 5.7 million new weekly cases [2]. Globally, as of May 11, 2021, there have been over 158 million confirmed cases including over 3 million deaths, including the African continent, which is highly impacted [2, 3]. Ethiopia, the second-most populous African country, reported its first case on 13 March 2020 [4] and has now

reached over 260,000 confirmed cases and 3,888 deaths [5]. The country has the 4th highest number of COVID-19 confirmed cases on the African continent and has the highest death rate among East African countries [6]. Most of the cases in Ethiopia are from Addis Ababa, the capital city, with a projected population of over four million [7]. COVID-19 has consistently resulted in a high positivity rate, number of health facility admissions, and deaths in the city. Not only is the city an epi-center of COVID-19 in the country, epidemiological surveillance data shows a sharp inclining trend in the number of cases and death rate, which might indicate a high community transmission [6].

COVID-19 pandemic had strong negative socio-economic impacts that include income loss, health cost or concerns and other business impacts [7]. COVID-19 has consistently resulted in a high positivity rate, number of health facility admissions, and deaths in the city. Not only is the city an epicenter of COVID-19 in the country, epidemiological surveillance data shows a sharp inclining trend in the number of cases and death rate, which might indicate a high community transmission [6].

The COVID-19 pandemic and the associated economic crisis are posing huge challenges, raising many unknowns and imposing wrenching trade-offs. Both crises are global, but their impacts are deeply local. The policy response to both crises needs to be rapid, even if it is rough around the edges. Countries, however, cannot accomplish this on their own; the global crisis necessitates global solidarity and coordination [1].

The current COVID-19 crisis is challenging the delivery of essential services to the most affected segments of the population. Children and families who are already vulnerable due to socio-economic exclusion or those who live in overcrowded settings are particularly at risk [2].

To control the pandemic, save lives, and put the country's economy back to work, we need to be able to see the spread of COVID-19 in its entirety. Otherwise, we will all suffer the consequences. Besides, uncoordinated governmental responses may lead to disruption in the supply and demand chain of the market system [3].

COVID-19 has adversely affected the finances of governments and individuals. While the young ones can support themselves by engaging in different activities, it might be difficult for the elderly to support themselves during this crisis. A multi-country online survey on the assessment of quality of life in the elderly among Asian population showed that age, country of residence, marital status, number of male children, current employment status, health insurance, ability to pay household bills, frequency of family members visiting family members, and receiving support during COVID-19 pandemic affecting both physical and mental quality of life [8].

Several African countries have reacted quickly and decisively to curb the potential influx and spread of the COVID-19 virus very much in line with emerging international experience. As the situation evolves, there are more questions about the suitability and likely effectiveness of some of these measures, such as strict confinement. The large size of the informal sector (89 percent of total employment); the precariousness of most jobs; the limited coverage of pensions and unemployment insurance schemes; and the predominance of micro, small, and medium-size enterprises in business activity (90 percent) all need to be factored in, as they may make aggressive containment measures less effective. Protecting vulnerable groups, ramping up testing, and promoting the wearing of masks may be better options [4].

Given the significant effect of COVID-19 on the service sector in Ethiopia, and the enormous contribution of the

sector to overall GDP/economic growth of the country (46 percent) and urban employment (70 percent), it is imperative to make sure that the sector is operating at a highest possible level of capacity. When the latter is not feasible (as in the case of hotels & restaurants), finding alternative engagement for firms (such as using them to service the health sector) is important [5].

The COVID-19 pandemic was suddenly spread out in the world our country was not well prepared to combat the disease. Ethiopia as a least developed country encountered various obstacles like the other countries. The low socio economic status of the population along with the deficiency of resources in the health sector were the major impediments for the country to fight against the pandemic [1].

Most of the cases in Ethiopia are from Addis Ababa, the capital city, with a projected population of over four million [9]. COVID-19 prevention and control measures had different economic impacts on the society. The lockdown in Ethiopia caused different economic impacts like inflation of price of life goods, unexpected and unplanned costs of personal protective equipment like hand sanitizers and facemask. In addition to this the pandemic forced the society to reduce their capacity to earn income and the costs for internet and voice call also increased [10].

2. Methods and Materials

2.1. Study Settings

The study was conducted from January 25 to February 31, 2021 in Addis-Ababa city Administration. According to the Central Statistical Agency (CSA 2013), the projected population of the city for 2021 was about 4,234,000 [11]. Administratively, it is divided into 11 sub-cities and 116 districts. The city is a rapidly growing and expanding city, with five intercity road networks. Addis-Ababa has 13 public hospitals, 97 health centers, 25 private hospitals and 980 private clinics. There are also about 17,000 different mixes of health professionals of different categories.

2.2. Study Design

The study used cross-sectional study design.

2.3. Study Population

The study populations for this study were drawn from randomly selected woreda's of Arada, Lideta, Addis-Ketema and Kirkos sub cities. With the inclusion criteria of House hold heads whose age 18 years and above and who were able to talk and listen.

2.4. Study Variables

Dependent variables: Socio-economic implications of COVID-19 prevention and control measures and Independent variables: Age, sex, occupation, marital status, average monthly income, educational status, religion, smoking, alcohol drinking.

2.5. Sample Size and Sampling Techniques

The sample size was determined using a single population proportion formula. The calculation was made based on a 50% estimate of outcome variable of interest at 95% of confidence level, 5% precision, a design effect of 1.5 and 10% non-response rate, to get about 634 sample size. The households were selected systematically from wereda's of Addis-Ketema sub city woreda 7, Arada sub city woreda 10, Kirkos sub city woreda 10, and Lideta sub-city woreda 5.

2.6. Data Collection and Training

The data were collected using structured closed ended questionnaires using three sections Socio-demographic characteristics, life style, socio economic implications and coping mechanism. All data collection tools were prepared in English and translated into Amharic by experienced researchers. The tool was reviewed by group of experts selected from different institutions and appropriate amendments were made before the final administration of the instruments.

2.7. Validity and Reliability of the Questionnaire

To ensure validity and reliability of data collection instrument, the researchers were carried out different activities starting from the development of the questionnaire. The questionnaire was developed after intensive revision of different related literatures. The questionnaire also reviewed by experts and necessary correction was made. In addition to this, Clear instructions were introduced in the questionnaire to direct the respondents and to ensure reliability. In addition, the questionnaire was pre-tested to evaluate the validity, reliability, appropriateness, and sufficiency of the questions, and to measure how much time it took to complete the questionnaire.

2.8. Data Management and Analysis

The data were checked and entered into Epi-data Software and imported into SPSS version 25 for cleaning and analysis. Descriptive analysis using frequency, percentages, cross-tabulations and figures was performed to summarize and present the data. Binary logistic regression analysis was used to identify variables that are significant with the outcome variable at p value ≤ 0.20 and those variables were considered for the final model. Finally, multiple logistic analyses were carried out to identify the predictors of socio-economic implication. Backward stepwise regression method

was used to test the model's fitness. Those variables with p value ≤ 0.05 with adjusted odds ratio and 95% confidence interval were considered as statistically significant in the regression model, goodness-of-fit tests were conducted.

2.9. Ethical Considerations

The study protocol was reviewed and approved by the Institutional Review Board (IRB) of Yekatit-12 Hospital Medical College and Ethiopian Public Health Association. Permission to undertake this study was obtained from Addis-Ababa Health Bureau.

An informed consent form was made available to all participants of the study. The informed consent included essential information such as statements of potential risk, benefits, likely breaches of confidentiality and how these will be curtailed.

2.10. Operational Definition

Economic implication: negative economic outcomes and challenges observed as a result of COVID-19 prevention and control measures reported by the participants.

Social implication: negative social outcomes and challenges observed as a result of COVID-19 prevention and control measure reported by the participants.

Coping mechanisms: These are the measures that study participants would take when they are incapable of adhering COVID-19 prevention and control measures.

Slum: A slum is a highly populated urban residential area consisting of densely packed housing units of weak building quality and inhabited by impoverished people.

3. Results

3.1. Socio-demographic Characteristics of Respondents

About 634 participants were enrolled in the study with a response rate of 100%. The mean age of the study participants was 41.78 years with standard deviation of 12.8 years. Nearly half 309 (48.8%) of the participants were in the age group of 18-39 years old. About 440 (69.4%) of the respondents were females and 194 (30.6%) of them were males. With regard to the marital status of the participants, majority 372 (58.7%) of them are married and 239 (37.7%) of them were unemployed. From the total participants 157 (24.8%) were not educated and 248 (39.1%) were primary school completed. Regarding their monthly income, the majority, and 512 (80.7%) had less than 3000 Ethiopian birr per month (Table 1).

Table 1. Socio-demographic characteristics of respondents, Addis-Ababa, 2021 (N = 634).

Socio demographic Characteristic	Frequency	Percent
Age in year		
18-29	110	17.4
30-39	199	31.4
40-49	171	27.0
≥ 50	154	24.2
Sex		
Male	194	30.6

Socio demographic Characteristic	Frequency	Percent
Female	440	69.4
Marital status		
Married	372	58.7
Single	142	22.4
Divorced/separated/widowed	120	18.9
Occupation		
Employed	175	27.6
Daily laborers/petty traders	158	24.9
Unemployed	239	37.7
Others *	62	9.8
Educational Status		
No education	157	24.8
Primary school completed	248	39.1
High school completed	129	20.3
Technical/vocational and above graduated	100	15.8
Religion		
Orthodox Christian	459	72.4
Muslim	125	19.7
Others**	50	7.9
Income in EB		
<=1000	248	39.1
1001-3000	264	41.6
>3000	122	19.3

*Others: imply participants out of the listed occupation

**Others: imply catholic, protestant religion.

3.2. COVID-19 Prevention Practices of the Participants

From the total participants 63 (9.9%) and 146 (23%) were smokers and consumed certain types of alcohol respectively. Regarding COVID-19 prevention methods, majority, 471 (74.3%) of the study participants were used facemask on

daily base and only 17 (2.7%) of them never used facemask. Similarly 301 (47.5%) of them were practiced social distancing whereas 59 (9.3%) of them never practice social distancing. In addition, 224 (35.3%) of them used hand sanitizer whenever they contact any surfaces and 71 (11.2%) never used hand sanitizer (table 2).

Table 2. Socio –personal lifestyle and COVID-19 prevention practices of respondents, Addis-Ababa, 2021 (N = 634).

Variables	Number	Percent
History of smoking		
Yes	63	9.9
No	571	90.1
History of alcohol consumption		
Yes	146	23
No	488	77
Facemask utilization frequency		
Almost daily	471	74.3
At least weekly	67	10.6
Occasionally	79	12.5
Never used	17	2.7
Social distancing practice frequency		
Almost daily	301	47.5
At least weekly	96	15.1
Occasionally	178	28.1
Never used	59	9.3
Hand sanitizer utilization frequency		
Almost daily	169	26.7
When I have contact with surface	224	35.3
Occasionally	170	26.8
Never used	71	11.2

3.3. Economic and Social Implication of COVID-19 Prevention and Control Measures

As indicate in figure 1, more than half, 337 (53.2%) of the study participants were faced some types of economic

problem in relation to COVID-19 prevention and control methods. Among those who faced economic problems, 76 (12.0%), 95 (15.0%) and 39 (6.2%) of them faced increased prices of commodities, unable to buy sanitizer and other PPE and decreased income respectively (Table 3).

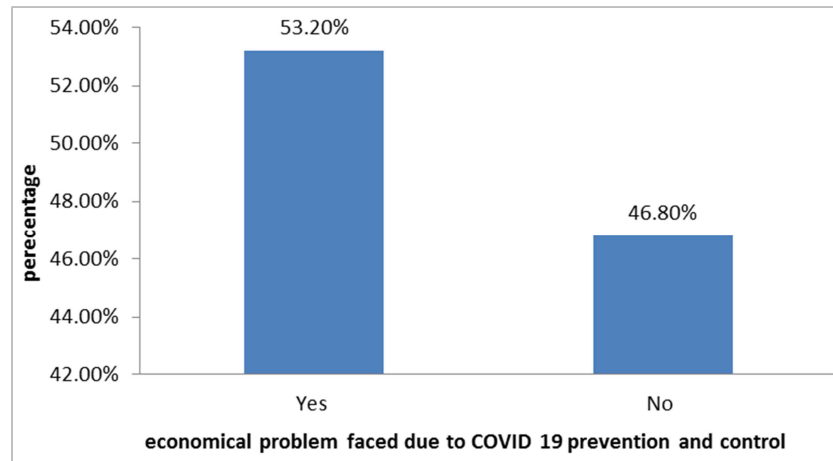


Figure 1. Economic implication of COVID-19 prevention and control measures among study participants in Addis Ababa, Ethiopia, 2021.

Table 3. Kinds of economic problem faced by study participants as result of COVID-19 prevention and control measures in Addis Ababa, Ethiopia, 2021.

Kind of Economic problems faced	Number	Percent
Increased price of commodities	76	12.0
Unable to buy PPE	95	15.0
Decreased job opportunity	51	8.0
Decreased income	39	6.2
Others	76	2.0
No problem at all	297	6.8
Total	634	100

3.3.1. Factors Associated with Economic Implications of COVID-19 Preventive and Control Measures

Table 4 Indicates potential factors associated with economic implications of COVID-19 preventive and control measures, taking into account the crude (unadjusted) and adjusted binary logistic regression. In this study, the factors that were associated with economic implications of COVID-19 preventive and control measures were age 18-29, being married and single in marital status, monthly income less than or equal to 3000 Ethiopian birr, practicing social

distancing at least weekly. Study participants whose age from 18-29 years of age were 65% less likely faced economic challenges (AOR= 0.45, CI: 0.25, 0.82) when compared with participants older than 50 years of age. Study participants who had monthly income of less than or equal to 1000 and 1000 up to 3000 Ethiopian Birr were nearly 2 times (AOR= 1.99, CI: 1.15, 3.46, AOR= 2.18, CI: 1.32, 3.61) more likely faced economic challenge when compared with those who had monthly income of more than 3000 Ethiopian Birr respectively (table 4).

Table 4. Factors associated with Economic implications of COVID-19 prevention and control measures among study participants in Addis Ababa, Ethiopia, 2021.

Variable	Economical implication		COR at 95% CI	AOR at 95% CI
	No	Yes		
Age in year				
18-29	67	43	0.39 (0.23, 0.64)*	0.45 (0.25, 0.82)*
30-39	92	107	0.70 (0.46, 1.08)	0.78 (0.48, 1.27)
40-49	80	91	0.69 (0.44, 1.07)	0.80 (0.49, 1.32)
>=50	58	96	1	1
Marital status				
Married	173	199	0.77 (0.50, 0.17)*	0.83 (0.53, 1.30)
Single	76	66	0.58 (0.35, 0.95)*	0.81 (0.46, 1.44)
Divorced/separated/widowed	48	72	1	1
Occupation				
Employed	92	83	1	1
Daily laborers/petty traders	71	87	1.36 (0.88, 2.09)	1.11 (0.67, 1.84)
Unemployed	96	143	1.65 (1.11, 2.45)*	1.28 (0.78, 2.10)
Others *	38	24	0.70 (0.39, 1.29)	0.59 (0.30, 1.15)
Monthly income in Birr				
<=1000	104	144	2.29 (1.47, 3.57)*	1.99 (1.15, 3.46)*
1001-3000	117	147	2.08 (1.34, 3.22)*	2.18 (1.32, 3.61)*
>3000	76	46	1	1

Variable	Economical implication		COR at 95% CI	AOR at 95% CI
	No	Yes		
Educational status				
No education	74	83	1.32 (0.80, 2.18)	0.69 (0.37, 1.32)
Primary school completed	112	136	1.43 (0.89, 2.27)	0.79 (0.44, 1.41)
High school completed	57	72	1.48 (0.88, 2.51)	1.06 (0.59, 1.90)
Technical/vocational and above graduated	54	46	1	1
Social distancing practice frequency				
Almost daily	149	152	1	1
At least weekly	34	62	1.79 (1.11, 2.88)*	2.07 (1.22, 3.52)*
Occasionally	87	91	1.03 (0.70, 1.49)	1.38 (0.87, 2.20)
Never used	27	32	1.16 (0.66, 2.03)	1.37 (0.69, 2.70)
Hand sanitizer utilization frequency				
Almost daily	70	99	1	1
When I have contact with surface	109	115	0.75 (0.50, 1.12)	0.66 (0.42, 1.04)
Occasionally	91	79	0.61 (0.40, 0.94)*	0.55 (0.32, 0.93)*
Never used	27	44	1.15 (0.65, 2.04)	1.21 (0.59, 2.47)

*p-value less than 0.05.

Regarding social implication of COVID-19 prevention and control measures, 325 (51.3%) were faced different kinds of social problem. From those who faced social problems, 206 (32.5%) were faced social interaction problem or weak communication and 19 (3%) of them also faced discrimination and isolation (figure 2 and Table 5).

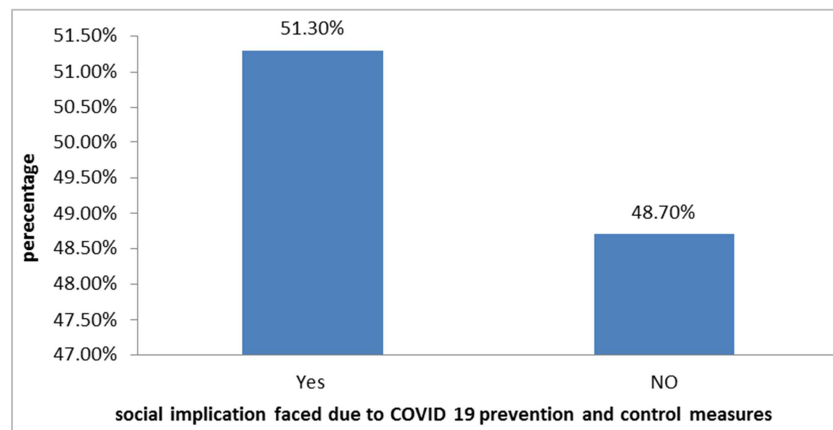


Figure 2. Social implication of COVID-19 prevention and control measures among study participants in Addis Ababa, Ethiopia, 2021.

Table 5. Kinds of Social problem faced by study participants as result of COVID-19 prevention and control measures in Addis Ababa, Ethiopia, 2021.

Kinds of social problem faced	Number	Percent
No social interaction/weak communication	206	32.5
Discrimination and isolation	19	3.0
Others	100	15.8
No problem at all	309	48.7
Total	634	100

3.3.2. Factors Associated with Social Implications

From the binary logistic regression, we have understood that the factors that were associated with social implications were age from 18-29 years, single in marital status, monthly income less than or equal to 1000 Ethiopian Birr and smoking. But

none of them were not maintain their significant association with multivariate logic regression analysis except history of smoking. Those who smoke cigarette were 1.88 times (AOR=1.88, CI: 1.06, 3.32) more likely faced social problem when compared with non-smokers (table 6).

Table 6. Factors associated with Social implications of COVID-19 prevention and control measures among study participants in Addis Ababa, Ethiopia, 2021.

Variable	Social implication		COR at 95% CI	AOR at 95% CI
	No	Yes		
Age in year				
18-29	62	48	0.60 (0.36, 0.98)*	0.76 (0.43, 1.34)
30-39	99	100	0.78 (0.51, 1.19)	0.88 (0.55, 1.39)
40-49	81	90	0.86 (0.55, 1.33)	0.96 (0.60, 1.54)
>=50	67	87	1	1

Variable	Social implication		COR at 95% CI	AOR at 95% CI
	No	Yes		
Marital status				
Married	178	194	0.81 (0.53, 1.22)	0.85 (0.55, 1.32)
Single	80	62	0.57 (0.35, 0.94)*	0.64 (0.37, 1.12)
Divorced/separated/widowed	51	69	1	1
Occupation				
Employed	89	86	1	1
Daily laborers/petty traders	74	84	1.18 (0.76, 1.81)	1.03 (0.64, 1.67)
Unemployed	108	131	1.26 (0.85, 1.86)	1.09 (0.68, 1.74)
Others *	38	24	0.65 (0.36, 1.18)	0.62 (0.32, 1.17)
Monthly income in Birr				
<=1000	114	134	1.58 (1.02, 2.45)*	1.35 (0.81, 2.24)
1001-3000	125	139	1.50 (0.97, 2.31)	1.38 (0.87, 2.20)
>3000	70	52	1	1
Smoking				
Yes	25	38	1.50 (0.89, 2.56)	1.88 (1.06, 3.33)*
No	284	287	1	1
Hand sanitizer utilization frequency				
Almost daily	70	99	1.46 (0.83, 2.54)	1.38 (0.76, 2.51)
When I have contact with surface	116	108	0.96 (0.56, 1.63)	0.95 (0.54, 1.70)
Occasionally	87	83	0.98 (0.56, 1.71)	0.97 (0.54, 1.74)
Never used	36	35	1	1

4. Discussion

It is stated in several literatures that containment measures have had a much larger adverse impact on economic activity in countries with relatively small fiscal packages – equivalent to a 22% decline in industrial [9]. Similarly, the restriction measures taken by the Ethiopian government to prevent COVID-19 have adverse effects on socio-economic status of the people like prolonged cessation in economic activities [10]. In this study more than 53% of respondents have reported economic related challenges while a study conducted in Taiwan and Kampala, Uganda indicated that about 18% & 30% of study participants reported for the same economic challenges respectively [12, 13]. Since our study was conducted in selected slum sub-cities, the nature of participants in these areas may have inflated the number.

Globally around 495 million (14%) of the total work forces loss their jobs as result of closures of organization/working areas due to COVID-19 pandemic [14]. Similarly, COVID-19 preventives measures had negative impacts on income loss in the population of developing countries including Ethiopia [15]. In this study about 76 (12%) of them reported increased prices of commodities and nearly 95 (15%) of respondents were unable to buy sanitizer and other personal protective equipment. More than 51 (8.0%) of the respondents reported decreased job opportunities. This findings were lower when compared with study done in Equatorial Guinea (which Indicated COVID-19 causes 50% of survey population loss their jobs) and in Ethiopia which indicated 319 (55%) and 84 (14%) of the participants affected by loss or difficult to obtain jobs and affected by increased cost of food items respectively [16, 17] and the study conducted in Kenya also indicated 107 (50%) of faced partial loss in their income [18]. This variation may be the difference in the area covered by the two studies. The

monetary impacts reported by UNICEF indicated that the current COVID emergency measure could contribute the rise in inflation and inability of exchange rates. For example, increase in prices due to reduced offers will mostly affect lower-income families and older people in society [4]. The unemployment rate of this study is 37.7%. UNICEF has also estimated the unemployment for the African continent to be 48% due to reduction in production. A similar study conducted by World Bank group in Saint Lucia revealed that about 30% of respondents were finding themselves without job as a result of adoption of COVID-19 prevention and control measures [19]. The variation among the studies may have occurred as a result of sample size variation.

Based on the research findings age, educational status, household size associated with negative economic impacts of COVID 19 preventive measures [20]. Based on the findings of this study factors that were associated with economic and social implications of COVID-19 preventive and control measures include age, marital status, monthly income, social distancing practice and smoking.

5. Conclusion

In this study more than half of study participants reported that economic challenges were imposed on them as a result of adherence to COVID-19 prevention and Control. Factors that were associated with economic implications of COVID-19 preventive and control measures include age, marital status, monthly income and social distancing practice.

Regarding the social implications of COVID-19 prevention and control measures, more than half of the respondents reported that they have encountered social interaction gaps as a result of COVID-19 prevention and control measures endorsed a year back. Being private age, marital status, monthly income and smoking were also associated with social implications.

Conflict of Interest

The authors declare that they have no competing interests.

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