

1 The psychological impact of COVID-19 pandemic among communities living in Dilla town,  
2 Ethiopia, April 2020.

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28 **Abstract**

29 **Background:** The COVID-19 pandemic is the global public health emergency concern and had  
30 an impact on the day to day life of individuals. Its effect on an individual's mental health is  
31 significant to the extent of suicide.

32 **Objective:** This study aimed to assess the magnitude of psychological problems and its  
33 associated factor among communities living in Dilla town in response to the pandemic.

34 **Methods:** From Apr 1- Apr 15, 2020, a community-based cross-sectional study was conducted  
35 using multi-stage sampling techniques. Self-administered the questioner, Depression, Anxiety  
36 and Stress Scale (DASS-21), and logistic regression analysis (95% CI, p-value <0.05) was used.

37 **Results:** This study included 445 respondents with a 94% non- response rate who was living in  
38 Dilla town. In total, 34.4% of respondents had a psychological problem (11.4 % mild and 23%  
39 moderate level of the psychological problem). Female, Greater secondary level of education,  
40 monthly income below 500 ETB, more than three family size, and wearing face mask were  
41 variables associated with the outcome variable ( $p < 0.05$ ).

42 **Conclusions:** Nearly one-third of the respondents had mild to moderate psychological among  
43 communities living in Dilla town. There is a need for mental health support on those identified  
44 groups of peoples to enhance their resilience in response to the pandemic.

45 **Keyword** – Anxiety, depression, stress, corona virus, Dilla, Ethiopia

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## 56 **Introduction**

57 The first onset of the 2019 coronavirus disease (COVID-19) pandemic was in Wuhan city, china,  
58 and it kills more than 120 million peoples in the world, which is also much higher than the 2012  
59 Saudi Arabia severe acute respiratory syndrome epidemic[1-2].

60 Globally 2,143,703 confirmed cases and 143,258 deaths and in Africa from 52 countries 16,200  
61 confirmed cases, 873 deaths, 3,235 recoveries, and in Ethiopia 95 confirmed cases and three  
62 deaths were recorded within the month [3]. Since the number of cases was increasing day to day

63 declare the COVID -19 outbreak of global public health emergency of international concern [4].

64 The virus is most contagious and transmits to humans through respiratory droplets as main mode  
65 transmission from humans and symptoms were fever, cough, fatigue, breathing difficulty [5].

66 The incubation period of the virus was 6 days ranging from 2 to 11 days and this helps for a  
67 quarantine period of duration for suspected cases [6]. Age greater than 65 years and chronic

68 medical comorbidities has a greater chance to get infected, with bad outcomes [7]. After the

69 onset fourth confirmed cases of coronavirus in Addis Ababa, the capital city of Ethiopia,

70 Ethiopian ministry of health approve as it is epidemic starts to look different measures including

71 closing all schools and universities for one month, transmitting information through different

72 social media about the different prevention strategies of the virus such wearing face masks,

73 distributing hand washing facilities including soaps, sanitizers, alcohol and water [8].

74 Previous studies done showed infection outbreaks had a psychological impact on individuals

75 including the feeling of anxiety about contacting the illness, hopelessness, and fear of stigma at

76 the international level [9].

77 The ongoing COVID-19 epidemic has a significant psychological impact on patients,

78 professionals, and communities around the world and in China, a country in which the first

79 epidemic has occurred, they were started online mental health service following a few days of

80 the outbreak [10]. Almost half of the respondents had the fear and worry of contracting influenza

81 during 2010 swine flu outbreak [11].

82 During the 2007 Singapore severe acute respiratory syndrome outbreak, almost half of non-

83 infected communities had psychiatry problems such as anxiety, depression, and post-traumatic

84 stress disorder. The predictor variables associated with psychiatry problems were younger age,

85 female, older, highly educated [12- 13].

86 A study done in Iran showed that there should be immediate psychological intervention  
87 including supportive individual and group therapy, outpatient and inpatient mental health service  
88 for the confirmed and suspected case, family members, and the community [14].

89 Nearly more than half (53%) of Chinese communities were reported moderate to severe  
90 psychological problems, including 16.5% depressive symptom, 28.8% anxiety symptoms, and  
91 8.1% stress symptom [15]. There is no sufficient study done on the psychological and mental  
92 health impacts on the COVID-19 pandemic, especially low and middle-level countries.

93 Therefore, the purpose of this study was to determine the magnitude of psychological symptoms  
94 and its associated factor related to the pandemic. This study result might be used for generating  
95 appropriate mental health crisis management guidelines for the promotion of the psychosocial  
96 wellbeing of the community in response to the epidemic.

## 97 **Methods and Materials**

### 98 **Study area, study period and study design**

99 It was a community-based cross-sectional study conducted from April 1- 15, 2020, in Dilla town.  
100 It is located in the southern part Ethiopia, and 359 km far from Addis Ababa (the capital city of  
101 Ethiopia, the main road from Addis Ababa to Kenya crosses), currently, 79,892 peoples are  
102 living in the city.

### 103 **Eligibility criteria**

104 The inclusion criteria of this study were respondent's age 18+ and able to read and write either of  
105 the local languages, Amharic, or Gedeoffa local languages. The exclusion criteria of this study  
106 were those who weren't able to fill the self-administered questioner due to different reasons (not  
107 in the house during the data collection period, acutely or severely ill).

### 108 **Sample Size calculation**

109 To calculate the sample size, we used the previous study done in China in the same epidemic  
110 which was 53.8 % (15) and by using a single proportion formula of cross-sectional study design.  
111 It was calculated by using a single proportion formula from the study was done in china  $P=$   
112 0.54%

113 Where,  $n =$  required sample size  $n= Z(\alpha/2) 2 pq / d^2$ ,  $p= 0.54$

114  $= (1.96) (1.96) (0.54) (0.46) / (0.05) (0.05)$

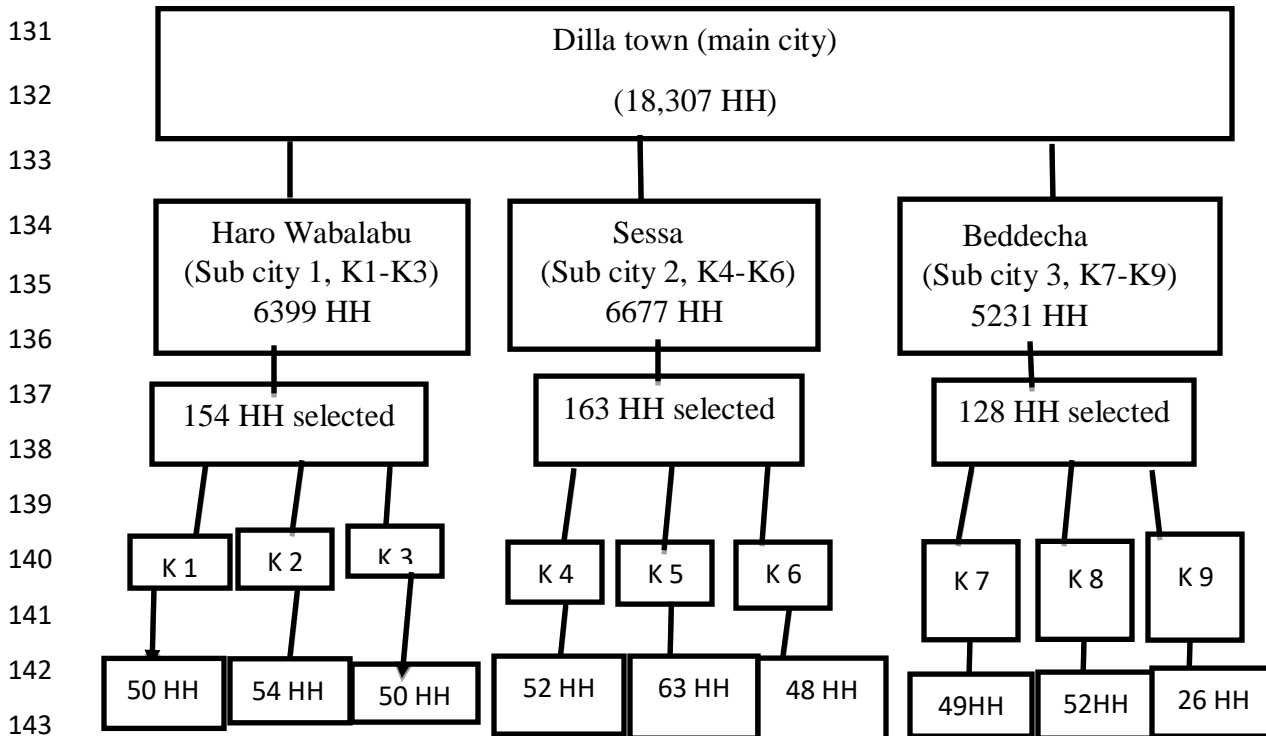
115  $= 382$

116 Where  $z$  is the reliability coefficient at a 95% confidence interval (1.96)

117 W (margin of error) =0.05 and  
 118 N= non-response rate 15% =63  
 119 The final total sample size was, 382+ 63 = 445

## 120 Sampling technique and procedure

121 The sampling technique of this study was a multi-stage random sampling. Dilla town has 03  
 122 kifle ketemas/sub-cities listed as Haro Wabalabu, Sessa, and Beddecha, and 09 kebeles (each  
 123 sub-city has three kebeles). The dilla town has 18,307 households (K1= 2069 HH, K2= 2220  
 124 HH, K3= 2110 HH, K4= 2131 HH, K5=2564 HH, K6= 1982 HH, K7=2021 HH, K8=2131 HH,  
 125 and K9 = 1079 HH), The numbers samples were proportionally allocated to each sub-city using  
 126 the formula of proportionate stratification formula,  $n_k = ( N_k / N ) * n$  ( $n_k$  = a required number  
 127 of households for each kebele,  $N_k$  = total household of each kebele,  $N$ = total population size in  
 128 each sub-cities,  $n$ = total number of households assigned for each sub-cities ), then to every three  
 129 kebeles of the sub-city. Finally, the respondents were sampled at the household level using  
 130 simple random sampling after the first a household was selected by the lottery method (fig.1.0).



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145 Fig 1.0. Schematic diagram of sampling procedure (K= kebele, HH= house hold) (n=445)

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**148 Data collection tools**

149 All questionnaires were adopted from the previous literatures done on the similar topic.

150 The first part of the questioner is about the socio-demographic characteristics of respondents  
151 adopted from the previous study done on the similar topic [12-15].

152 The second part of the questioner was Depression, Anxiety and Stress Scale (DASS-21) a 21-  
153 item Likert scale and the total score of each subcomponent added and if the score was < 30 ( Normal ),  
154 30-43 (mild) and 43-59 (moderate ) > 60 ( severe) psychological problem [16].

155 The final part of the questioner was about the current knowledge, attitude, and practice of  
156 coronavirus (KAP) assessed by a 16 item questioner adopted from the world health organization  
157 COVID-19 training manual. The 12 items for knowledge, two questions for each attitude, and  
158 practice. The higher score is Good knowledge, and the lowest score is poor knowledge. [17].

**159 Variables**

160 Dependent variable - Psychological problem

161 Independent variables- The list of independent variables was Age, sex, educational status,  
162 occupational status, family size, and monthly income, and KAP about COVID-19.

**163 Data collection procedures**

164 After we prepare carefully designed questioner and training manual we give training for  
165 supervisors for three days on the aims of the study, format questionnaire, how to gather house to  
166 house from the respondents by considering the value of privacy and confidentiality, then we  
167 administer self-administered questioner to each respondent of the household then fill within one  
168 day of duration for complete and basic information and on the next day we collect all the  
169 required number of samples by checking the completeness of questioner.

**170 Data quality control**

171 The pretest was done for 5% of the respondents before two weeks of the actual data collection  
172 period and not included in the main study. The questioner translated into the Amharic and  
173 Gedeoffa language and back-translated to English to check the consistency. The Amharic and  
174 Gedeoffa version questioner used for data collection.

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179 **Data processing and Analysis**

180 Data was entered into the Epi-Data 3.4 software package and exported to the Statistical Package  
 181 for Social Science version 22. Descriptive statistics (frequencies and percentages) and cross-  
 182 tabulation calculated to see the distribution of study variables among study participants.  
 183 Bivariate and multivariable logistic regression was conducted to determine the associated  
 184 variable of outcome variable at (95 CI and p-value < 0.05). Finally, the results of the study were  
 185 summarized by frequency tables, graphs, and narrative descriptions.

186 **Result**187 **Sociodemographic characteristics result of the respondents**

188 The response rate of this study was 94%. The mean age onset of the respondents 35 years of age,  
 189 nearly two-thirds of respondents had more than three family sizes and the average mean monthly  
 190 income was 500 ETB (Table 1).

191 Table 1. Socio-demographic characteristics results of respondents living in Dilla town Ethiopia  
 192 2020 (N = 445).

Variable	Category	Frequency (n=445)	Percentage (%)
Sex	Male	200	45%
	Female	245	55%
Marital status	Single	95	21.4%
	Married	229	51.4%
	Divorced	89	20%
	Widowed	32	7.12 %
Educational status	No-formal education (able to read and write )	82	18.4%
	Primary	44	9.88%

	Secondary	110	24.7%
	More-than secondary	209	47%
Occupation	Private job	206	46.4%
	Government job	239	53.5 %
Family size	One	40	9.04 %
	Two	111	25%
	Three and above	294	65.9%

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194 More than two third of the respondents avoid to go crowded place and only one third of wearing  
195 mask for protecting Covid-19 (Table 2).

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197 Table 2.0 Knowledge, Attitude and Practice response of respondents living in Dilla town,  
198 Ethiopia (N=445)

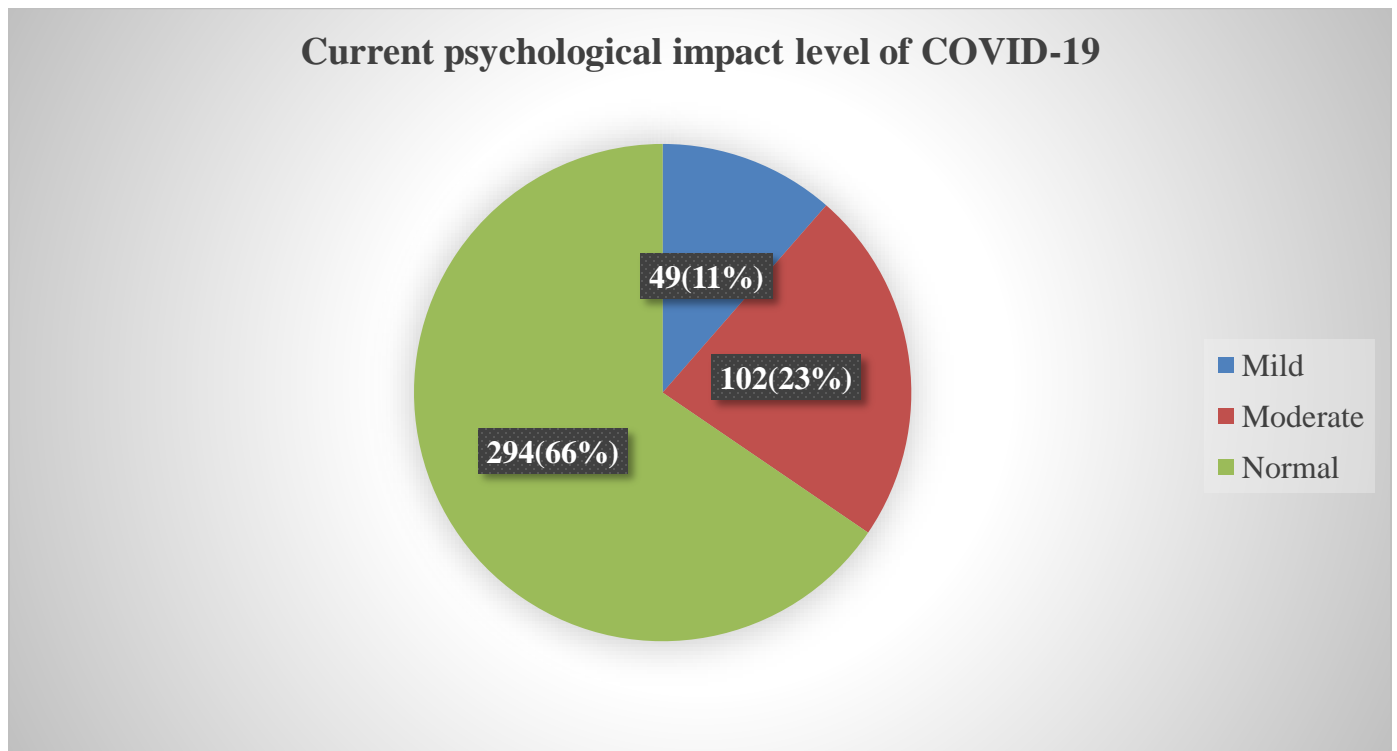
	Knowledge assessment tool	True	False (I Don't know)
1	The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia	334(75%)	111(25%)
2	Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus.	191(43%)	254(57%)
3	Currently there is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection.	165(37%)	280(63%)
4	Not all persons with COVID-2019 will develop to severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases.	142(32%)	303(68%)



5	Eating or contacting wild animals would result in the infection by the COVID-19 virus.	114(25.7%)	331(74.3%)
6	Persons with COVID-2019 cannot infect the virus to others when a fever is not present	160(36%)	285(64%)
7	The COVID-19 virus spreads via respiratory droplets of infected individuals	409(92%)	36(8%)
8	Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus	374(84%)	71(16%)
9	It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus	93(21%)	352(79%)
10	To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and  Avoid taking public transportations.	423(95%)	22(5%)
11	Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	390(87.5%)	55(12.5%)
12	People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days	327(73.5%)	118(26.5%)
	Attitude	Agree	Disagree (I don't know)
13	Do you agree that COVID-19 will finally be successfully controlled?	254(57%)	191(43%)
14	Do you have confidence that Ethiopia can win the battle against the COVID-19 virus	289(65%)	156(35%)
	Practice	Yes	No
15	In recent days, have you gone to any crowded place?	160(36%)	285(64%)
16	In recent days, have you worn a mask when leaving home?	129(29%)	316(71%)

199

200 Nearly one -thirds of the respondents (34%) were reported as mild to moderate level of a  
201 psychological problem symptom (figure 2.0).



202

203 Figure 2.0. Current mental health status of respondents in response to corona virus who were  
204 living in Dilla town, Ethiopia (N=445).

### 205 **Factors associated with psychological problem**

206 Variables associated with the outcome variable during bivariate and multi variant logistic  
207 regression at 95% CI were female gender, greater than secondary level of educational status, less  
208 500 ETB monthly incomes, more than three family size and those who wear face mask for  
209 prevention. The odds of being a female's gender 2.52 times more likely impacted by  
210 psychological problems, whereas having low educational status ( $\leq$  primary) 0.13 times less likely  
211 to develop psychological symptoms. Monthly income less than 500 ETB 2.12 times more likely  
212 to experience psychological problems whereas having less than one family size 0.40 times less  
213 likely to develop a psychological problem in response to the pandemic (Table 3).

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215 Table 3.0. Association of Sociodemographic characteristics and current mental health status of  
 216 respondents living in Dilla town in response to COVID-19 epidemic, Ethiopia 2020, (N=445).

Variables	Category of variables	Psychological problem		COR	AOR
		Yes	No		
Sex	Male	84	116	1	
	Female	181	64	2.72 ( 1.45-3.12)*	2.52 (2.01-3.45)*
Marital status	Single	50	45	1.28 (0.05 -1.54)	
	Divorced	33	56	0.841 (0.65-1.77)	
	Widowed	21	11	1.35( 0.89-1.90)	
	Married	169	60	1	1
Educational status	No-formal education(able to read and write)	48	34	0.17(0.70-0.84)*	0.13(0.40-0.48)*
	Primary	30	14	0.12(0.10 -0.78)*	0.80(0.50-0.80)*
	Secondary	80	30	0.98 (0.79-1.46)	0.83(0.34-1.35)
	More-than secondary	180	29	1	1
Occupation	Private job	86	120	1.33(1.10-2.85)	
	Government job	184	55	1	
Monthly income	Above 500 ETB	154	99	1	1
	Below 500 ETB	118	74	2.76 ( 2.21-3.45)**	2.12( 2.10-3.29)**
Number	One	15	25	0.11( 0.60-0.23)**	0.40(0.10-0.16)**

of Family size	Two	70	41	0.33(0.12-0.55)**	0.24 (0.19-0.81)**
	Three and above	187	107	1	1
Wearing mask	Yes	122	7	1	1
	No	148	168	0.54(0.13-0.79)*	0.32(0.21-0.66)*
Avoid going into crowded place	Yes	26	134	1	
	No	111	174	0.43(0.89-1.50)	

217 1=Reference, for COR, \*  $p < 0.25$ , and for AOR, \* =  $p < 0.05$  and, \*\*  $p < 0.01$

## 218 Discussion

219 This study found 33.4% of the respondents were experienced mild to moderate psychological  
 220 problems including stress, anxiety, and depression symptoms in response to COVID 19 global  
 221 epidemic. This result was high as since there is no confirmed case identified in city and  
 222 implicated as there is a need for immediate mental health crisis intervention in response to the  
 223 epidemic in city.

224 This study finding was lower than the study done in China in response to the COVID-19  
 225 epidemic which was 53.8% [15]. It might be due to the difference in literacy about the  
 226 coronavirus and no reported confirmed case found in this study area.

227 This study showed found that female was 4.21 times more likely to develop stress 4.21 [AOR=  
 228 4.21; 95%CI: (2.01-7.45)] as compared with male and this result similar to the study done china  
 229 (15) and might explain females in Ethiopia were highly responsible for family and worry much  
 230 about the health of family moreover, they had a high chance contact with different people for  
 231 their day to day activity inside and outside the home.

232 This study found that respondents who had no formal education 0.08 times 0.08 [AOR= 0.08;  
 233 95%CI: (0.04-0.15)]and primary level of education 0.35 times [AOR= 0.35; 95% CI: (0.50-  
 234 0.80)] less likely to develop psychological problems as compared those who more than a  
 235 secondary level of education and this finding was similar to the study done in china among  
 236 volunteer health service providers of the epidemic [18]this might be explained not having more  
 237 information and knowledge about the mortality and morbidity coronavirus among those who  
 238 had low-level education might protective for not to worry much in response to the epidemic.

239 This study finding showed that respondents who had below 500 ETB monthly incomes were  
240 1.80 times [AOR= 1.80; 95% CI: ( 1.10-3.29)] more likely to experience psychological problems  
241 and this result might be explained by those who had low income were daily labors, street market  
242 traders and farmers by their occupation and due to the government declares state of emergency  
243 due to COVID-19 and their daily income is not as previous as a result the can't afford to buy  
244 safety prevention methods including facemask, soap, alcohol and use private transport for  
245 minimizing the chance of crowdedness and contact with different people.

246 This study found that respondents who had one family size were 0.31 times [AOR= 0.31; 95%  
247 CI:(0.10-0.66)] less likely to develop the psychological problem as compared to those who had  
248 more than three and above family size and this result might be explained since each family  
249 member was contacting daily with different people for a different purpose and the virus was high  
250 contagious through contact their worry becomes significant about the chance of getting a disease.

251 This study found that respondents who were not using a face mask for prevention 3.32 times  
252 [AOR=3.32; 95% CI: (1.21-6.66)] more likely to develop the psychological problem than those  
253 who were not using a face mask and this might be explained face mask use decrease the worry  
254 and stress related to contacting the virus.

### 255 **Limitation of the study**

256 As the study used a cross-sectional study design, no conclusions can be drawn regarding  
257 causality and alternative explanations of the findings and cannot be ruled out.

### 258 **Conclusions**

259 This study found that a 34 % magnitude of psychological problem such as anxiety, stress and  
260 depression. The negative independent predictors were being female, secondary and above level  
261 of education, monthly income below 500 ETB, more than three family size and use face mask.

### 262 **Recommendation**

263 All communities of the city especially government and private health sector organizations were  
264 highly responsible for preventing and controlling mental health crisis of the epidemic through  
265 transmitting Up-to-date and specific information through different social media about the  
266 prevention of the virus and how to cope with the psychological stress of the pandemic about  
267 disease severity, social and economic crisis. There should be a continuous supply of  
268 precautionary preventive equipment including, facemask, water, soap, alcohol, and sanitizer for  
269 those who had more than three family members and low income. The mental health professional

270 should work hard by giving attention to the impact of respondents with severe economic and  
271 social crises. Moreover, work with the integration of stakeholders through teaching how to  
272 handle stress in response to the epidemic through different social media is vital to lower the  
273 psychological impact of the epidemic.

274 There is a need to formulate a local-based emergency mental health intervention guide for  
275 improving the mental health and psychological resilience of a community in response to the  
276 pandemic.

### 277 **List of abbreviations**

278 AOR-adjusted odd ratio

279 CI: Confidence interval

280 COR –Crude odd ratio

281 COVID-19 - Consider Coronavirus Disease 2019

282 DAAS- Depression, Anxiety and Stress Scale

283 ETB- Ethiopian birr

284 KAP- knowledge, awareness, and practice

### 285 **Ethics approval and consent to participate**

286 Ethical clearance was gained from the ethical review board of Dilla University and written  
287 consent was obtained from the study participants. The confidentiality of information obtained  
288 from respondents was ensured.

### 289 **Acknowledgement**

290 The author would like to thank the clients who participated in the study and Dilla University.

### 291 **Conflicts of Interest**

292 The author declare no potential conflicts of interest with respect to the research, authorship  
293 and/or publication of this article.

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