Check for updates

COVID-19 Pandemic Related to Anxiety Disorder Among Communities Using Public Transport at Addis Ababa, Ethiopia, March 2020: Cross-sectional Study Design

Chalachew Kassaw[1] · Digvijay Pandey[2]

Abstract

Coronavirus disease (COVID-19) continues to be the World Health Organization's focus for action for managing the spread and mortality. Public transport is mostly used in the city to serve many people at a time. It was a risky area for contracting the infection. The mental health of a community is vital to promote their immunity and day-to-day activities of humans. This study aimed to determine general anxiety disorder among public transport users in relation to new coronavirus pandemic during the initial phase at Addis Ababa, Ethiopia. The cross-sectional study design was conducted from March 15 to 25, 2020, using a stratified sampling technique. The structured interview was used to collect information on demographic data and general anxiety disorder for the past 2 weeks related to COVID-19. Generalized Anxiety Disorder-7 was used to assess the outcome variable, and logistic regression analysis at a 95% confidence interval, $p < 0.05$, was used to predict variables associated with the outcome variable. This study enrolled 420 respondents who were using public transport in Addis Ababa. Out of the total, 30.7% of respondents had general anxiety disorder, and being female, daily labor, more than three family sizes, and no face mask use were variables associated with the outcome variable ($p < 0.05$). One third of the respondents experienced general anxiety disorder in response to the pandemic. This study finding indicates that there is a need for immediate mental health crisis intervention at public transport users especially on those identified groups of peoples.

✉ Chalachew Kassaw
  1234berekassa@gmail.com

  Digvijay Pandey
  digit11011989@gmail.com

[1] Department of Psychiatry, College of Health Science, Dilla University, P.O. Box 419, Dilla, Ethiopia

[2] Department of Technical Education, IET, Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow 226021, India

Abbreviations

AOR	Adjusted odd ratio
CI	Confidence interval
COR	Crude odd ratio
COVID-19	Coronavirus disease 2019
ETB	Ethiopian birr
GAD	General anxiety disorder
KAP	Knowledge, awareness, and practice

Introduction

Public transport is an essential part of urban life, and many peoples in lower level income countries are using it to meet their daily needs. Traveling is a natural need of a human to fulfill their basic activities and needs of daily life (Lopez, 2003). The 2019 coronavirus disease (COVID-19) pandemic is a global concern after its first outbreak in Wuhan city of China and the largest by its coverage and death as compared to 2012, the first epidemic in Saudi Arabia (Mahase, 2020).

The virus continues to spread and was declared as an emergency health condition by the World Health Organization. Currently globally, there are 30,367,850 confirmed cases, 950,821 deaths, and 22,052,941 recoveries, and in Ethiopia, there are 1060 deaths (Cucinotta and Vanelli, 2020).

The virus is too contagious and transmits to humans through respiratory droplets, physical contact, and surface contact, and patients were both symptomatic and asymptomatic. The incubation period of the virus was a 1-week (2–14 days) period, which was a base for the quarantine period of duration for suspected cases and confirmed cases (WHO, 2020; Rehman, 2020).

Ethiopian Ministry of Health works on controlling the spreading virus at transport services, such as decreasing the number of passengers at each transport type to the extent of 50% of the previous number of passengers and legal punishment among those who were not using a face mask. Another important measure was the use of sanitizer during the entry to bus and daily disinfecting the seats of each passenger (Shigute, 2020).

Social distancing is the principal way of prevention method to control the transmission from human to human, including a 1-m distance of talk and staying away from people. However, these measures have a significant impact on passengers using different types of public transport for achieving their day-to-day activities (Beam and Kim, 2020; Culp, 2020)

As per my knowledge, there are no published studies done in low- and middle-level countries about public transport user's level of anxiety in response to the COVID-19 pandemic. Therefore, the purpose of this study was to determine the magnitude of general anxiety disorder and its associated factor among public transport users in relation to the new COVID-19 pandemic. This study result might be used as a reference for future studies and also for generating appropriate mental health crisis management among communities using public transport in response to the pandemic.

Methods and Materials

This community based cross-sectional study design was conducted from March 15- 25, 2020, at Addis Ababa city, the capital city of Ethiopia, and most cases were confirmed. In the city, there are 300 buses were giving service for the one-third population of the city (2 million people).

Eligibility Criteria

Inclusion Criteria: All peoples age 18 + and living in the city.

Exclusion Criteria: Respondents who were not able to respond to the interview (unable to hear and respond with the asked language, hearing problem, acutely or severely ill).

Sample Size Calculation

To calculate the sample size, we used a single proportion formula of a cross-sectional study design. The proportion value (P) from the previous study done in China on the same epidemic (53.8%) (Wang, 2020) was taken for the calculation.

P = 0.54%, q = 1 − p, 0.46.

where n = required sample size, $n = Z (\alpha/2) 2 pq/d2$, $p = 0.54$

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

= 382

where Z is the reliability coefficient at a 95% confidence interval (1.96)

W (margin of error) = 0.05

N non-response rate 10% = 38

The total sample size was 382 + 38 = 420

Sampling Technique and Procedure

A stratified sampling technique was used to select the bus from the three types of bus (Anebessa bus, Sheger bus, and Higer bus). "Anebessa" bus was serving for 100 people and travel up to 6 km, "Sheger bus" was serving 50 people and travel up to 4 km, and "Higer bus" was serving for 40 people and travel up to 2 km. Proportionate stratification formula, $nh = (Nh/N) \times n$ (nh = required sample, Nh = total sample size of each stratum, N = total population size, n = total sample size), was used to select the required number of the sample from each selected bus. Finally, simple random sampling with a lottery method was used to select each respondent from each selected bus. The ticket number was used as the sampling frame for the study.

n (Anebessa bus) = N (Anebessa bus total population stratum)/total population size × sample size = (300/570) × 420 = 221

n (Sheger bus) = N (Sheger bus total population the stratum)/total population size × sample size = (150/570) × 420 = 111

n (Higer bus) = N (Higer bus total population the stratum)/total population size × sample size = (120/570) × 420 = 88 (Fig. 1).
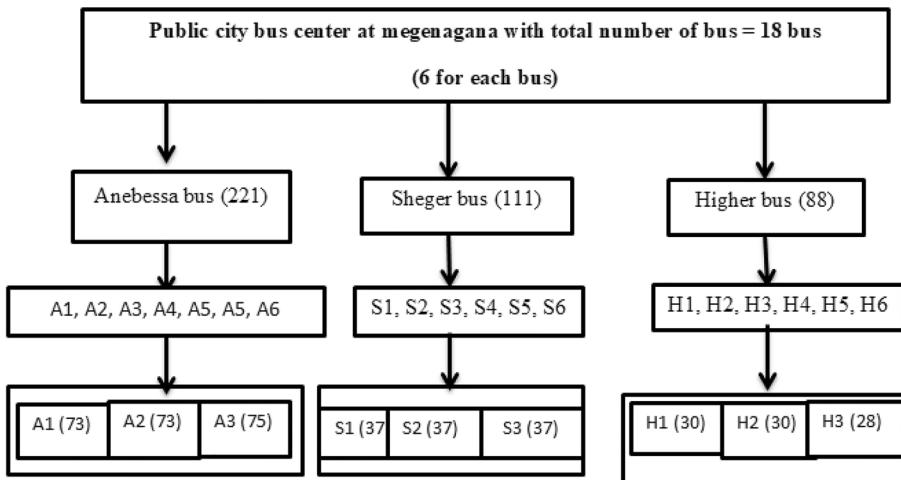
Fig. 1 Diagrammatic scheme of stratified sampling among respondents using public transport ($N = 420$)

Data Collection Instruments

All questionnaires were translated into Amharic and then to English, and finally, the Amharic version of the questioner was used for data collection.

General Anxiety Disorder: The first part of the questioner was GAD-7 (Generalized Anxiety Disorder-7) scale to assess the subject's anxiety symptoms. The GAD-7 assessment tool was validated and used in previous Ethiopia studies. It has seven items used to assess the frequency of anxiety symptoms over the past 2 weeks on a 4-point Likert scale ranging from 0 (never) to 3 (nearly every day) and ranging from 0 to 21, and score > 9 scores defined as had general anxiety disorder (Maideen et al., 2015).

Current Knowledge, Attitude, and Practice (KAP) About the Coronavirus. It was a 12-item questioner used to measure the knowledge, attitude, and practice of respondents towards COVID-19. During pretest, the Cronbach's alpha for this tool was 0.83 (Zhong et al., 2020).

Study Variables

Dependent Variable: General anxiety disorder.

Independent Variables: Age, sex, educational status, occupational status, family size, having a child less than five years, and knowledge, attitude, and practice about the coronavirus.

Data Collection Procedures

The carefully prepared questioner and training manual was used for data collection and training for data collectors about the aims of the study, formats the questionnaire, how to interview, and gather data from the respondents. The issues of privacy and confidentiality

were discussed during the training manual. The structured interviews were administered for each respondent and collected all the required information.

Data Processing and Analysis

Data was entered into the Epi-Data 3.4 software package and exported to the Statistical Package for Social Science version 22. Descriptive statistics (frequencies and percentages) and cross-tabulation calculated to see the distribution of study variables among study participants. The logistic regression analysis (5%CI, $p < 0.05$) was used for determining the predictors of the outcome variable.

Result

The mean age onset of the respondents was 32 years of age, and half of respondents had more than three family sizes; the average monthly income was 1000 ETB (Table 1).

Knowledge, Attitude, and Practice (KAP) About Coronavirus

More than two thirds of the respondents were not using face mask to prevent the COVID-19 pandemic transmission (Table 2).

Table 1 Socio-demographic characteristics results of respondents using public transport living in Addis Ababa, Ethiopia 2020 ($N = 420$)

Variable	Category	Frequency ($n = 420$)	Percentage (%)
Sex	Male	181	43%
	Female	239	57%
Marital status	Single	190	45.2%
	Married	94	22.3%
	Divorced	76	18%
	Widowed	60	14.2%
Educational status	Primary	63	15%
	Secondary	120	28.5%
	More than secondary	237	56.5%
Occupation	Daily labor	178	42.3
	Private job	122	29
	Student	85	20.2
	Unemployed	35	8.3
Family size	One	49	11.6%
	Two	165	39.2%
	Three and above	206	49%

Table 2 Knowledge, Attitude, and Practice response of respondents using public transport in Addis Ababa, Ethiopia (*N*=420)

	Knowledge assessment tool	True	False (I don't know)
1	The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia	260 (62%)	160 (38%)
2	Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus	197 (47%)	223 (53%)
3	Currently there is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection	160 (38%)	260 (62%)
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	134 (32%)	286 (68%)
5	Eating or contacting wild animals would result in the infection by the COVID-19 virus	100 (23.7%)	320 (76.3%)
6	Persons with COVID-2019 cannot infect the virus to others when a fever is not present	143 (34%)	277 (66%)
7	The COVID-19 virus spreads via respiratory droplets of infected individuals	382 (91%)	38 (9%)
8	Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus	307 (73%)	113 (27%)
9	It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus	109 (26%)	311 (74%)
10	To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportations	399 (95%)	21 (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	368 (87.5%)	52 (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	321 (76.5%)	99 (23.5%)
	Attitude	Agree	Disagree (I don't know)
13	Do you agree that COVID-19 will finally be successfully controlled?	239 (57%)	181 (43%)
14	Do you have confidence that Ethiopia can win the battle against the COVID-19 virus	260 (62%)	160 (38%)
	Practice	Yes	No
15	In recent days, have you gone to any crowded place?	284 (67.7%)	136 (32.3%)
16	In recent days, have you worn a mask when leaving home?	131 (31%)	289 (69%)

Table 3 The predictors of the outcome variable among respondents who were using public transport at Addis Ababa, Ethiopia, 2020 (N=420)

Variables	Category	Generalized anxiety disorder (GAD)		Adjusted odds ratio (AOR)	p value
		Yes	No		
Sex	Male	81	100	1	
	Female	179	60	3.68 (2.43, 5.57)	0.02*
Marital status	Single	70	120	1	
	Married	34	60	1.03 (0.62–1.72)	0.29
	Divorced	34	42	0.72 (0.42–1.24)	0.24
	Widowed	24	36	0.88 (0.48–1.59)	0.16
Educational status	Primary	30	33	1.20 (0.48–1.47)	0.18
	Secondary	44	76	0.58 (0.38–0.89)	0.01*
	More than secondary	123	114	1	
Occupation	Daily labor	123	55	3.78 (1.78–8.06)	0.001**
	Private job	57	65	1.29 (0.6–2.77)	0.18
	Student	35	50	1.18 (0.53–2.66)	0.12
	Unemployed	13	22	1	
Number of family size	One	16	23	1	
	Two	74	91	1.17 (0.58–2.37)*	0.21
	Three and above	144	62	3.34 (1.65–6.75)**	0.001**
Wearing mask	No	196	93	4.47 (2.87–6.95)*	
	Yes	42	89	1	0.001**

1=Reference.*$p \leq 0.05$; **$p \leq 0.01$**

Magnitude of General Anxiety Disorder

Out of all respondents enrolled in the study, 128 (30.7%) of them developed clinically significant generalized anxiety disorder (scored > 9/21) as a result of the current pandemic (COVID-19).

Predictors of the Outcome Variable

Variables associated with the outcome variable during multivariant logistic regression at 95% CI were female gender, daily labor, no face mask use, and more than three family sizes (Table 3).

Discussion

This study aimed to measure the magnitude of general anxiety disorder among public transport users during the initial phase of the pandemic, and 128 (30.7%) of them developed generalized anxiety disorder in response to the new COVID-19.

This study finding was lower than the community studies done in China, 53.8% (Wang, 2020). It might be due to the difference in literacy about coronavirus, income for using personal protective equipment, and the tool used to measure current mental status (DASS-21).

This study result was higher than the studies conducted among health professionals in India (25.3%) (Wilson et al., 2020) and Saudi-Arabia (7.3%). The public transport users had a chance of being worried and stressed due to the susceptibility for physical contact and inadequate access to personal protective materials, including sanitizers and handwashing facilities, which all result in fear of contracting the disease.

According to this study finding, being female had 3.68 (2.43, 5.57) times more likely to experience a general anxiety disorder, which was similar to the study done in Spain (Gómez-Salgado et al., 2020) and India (Ahmad et al., 2020). Females have frequent traveling history and responsibility for achieving the day-to-day activities outside the home and contribute to the risk of contracting infection due contact with different people by bus.

This study identified that those with daily labor occupation had 3.78 (1.78–8.06) times more likely to develop GAD as compared with other groups of jobs and evidenced in Russia (Kartseva and Kuznetsova, 2020). Daily laborers have a high susceptibility contacting infection due to their job situation of close contact with co-workers. Besides, they were not able to buy face masks and other safety preventive measures for the prevention of self and their family.

The current family size of respondents has an impact on the development of general anxiety disorder, and those with more than three family sizes had 3.34 (1.65–6.75) times more likely to develop GAD, which was supported by the study done in India (Ahmad et al., 2020). As the number of family size increases, their chance of contact with different people also increases, which contributes to getting infected due to its contagious nature, and their worry becomes very significant for fear of contracting the infection.

The last determinant variable for GAD was current face mask use, and those who did not use a face mask for prevention had 4.47 times (2.87–6.95) more likely to develop a general anxiety disorder, which was similar to the study done in China (Ying et al., 2020). The use of a face mask enhances awareness, knowledge, and information about prevention measures, which contribute to the feeling of psychological preparedness to prevent themselves and their families.

Conclusions

The current study found that one thirds of the respondents had general anxiety disorder. The predictors for the outcome variable were being female, daily labor, more than three family sizes, and no face mask use.

Therefore, public transport users' needs immediate mental health intervention from responsible government and private health sector organizations to reassure the passenger's psychological health. The government should provide supportive preventive materials such as face mask, glove soap, and alcohol for public transport users, especially for those with more than three family size and daily labor. The public transport service providers should prepare a relaxing, comfortable, and allocate enough number of the bus for the passengers to serve effectively through keeping safety measures of the prevention. The mental health professional should teach via accessible social media about how to cope with the current pandemic and lifestyle measures, which are helpful to increase immunity, including exercise, diet, and regular sleep.

Compliance with Ethical Standards

References

Ahmad, A., Rahman, I., & Agarwal, M. (2020). Early psychosocial predictors of mental health among Indians during coronavirus disease 2019 outbreak. *Journal of Health Sciences, 10*(2), 147–156.

ARehman, S., Majeed, T., Ansari, M. A., & Al-Suhaimi, E. A. (2020). Syndrome resembling Kawasaki disease in COVID-19 asymptomatic children. *Journal of Infection and Public Health*.

Beam, C. R., & Kim, A. J. (2020). Psychological sequelae of social isolation and loneliness might be a larger problem in young adults than older adults. *Psychological Trauma: Theory, Research, Practice, and Policy, 12*(S1), 58–62.

Cucinotta, D., & Vanelli, M. (2020). WHO declares COVID-19 a pandemic. *Acta Biomedica*, *91*(1), 157–160. https://doi.org/10.23750/abm.v91i1.9397

Culp, W. C. (2020). Coronavirus disease 2019. *A & A Practice, 14*(6), e01218. https://doi.org/10.1213/xaa.0000000000001218

Gómez-Salgado, J., Domínguez-Salas, S., Romero-Martín, M., Ortega-Moreno, M., García-Iglesias, J. J., & Ruiz-Frutos, C. (2020). Sense of coherence and psychological distress among healthcare workers during the COVID-19 pandemic in Spain. *Sustainability, 12*(17), 68–72. https://doi.org/10.3390/su12176855

Kartseva, M. A., & Kuznetsova, P. O. (2020). The economic consequences of the coronavirus pandemic: which groups will suffer more in terms of loss of employment and income? *Population and Economics, 4*(2), 26–33. https://doi.org/10.3897/popecon.4.e53194

López, J. C. (2003). Means of transportation. *Nature Reviews Neuroscience, 4*(6), 431–431. https://doi.org/10.1038/nrn1149

Mahase, E. (2020). China coronavirus: what do we know so far? *BMJ (Clinical Research Ed.), 368*(January), m308. https://doi.org/10.1136/bmj.m308

Maideen, S. F. K., Sidik, S. M., Rampal, L., & Mukhtar, F. (2015). Prevalence, associated factors and predictors of anxiety: a community survey in Selangor, Malaysia. *BMC Psychiatry, 15*(1), 1–12. https://doi.org/10.1186/s12888-015-0648-x

Shigute, Z., Mebratie, AD., Alemu, G., Bedi, A., (2020). Containing the spread of COVID-19 in Ethiopia. *Journal of global health*, *10*(1).

Wang, C. (2020). Ethiopian religious beliefs. *Int. J. Environ. Res. Public Healt*, *17*, 1729. https://doi.org/10.3390/ijerph17051729

Wilson, W., Raj, J. P., Rao, S., Ghiya, M., Nedungalaparambil, N. M., Mundra, H., & Mathew, R. (2020). Prevalence and predictors of stress, anxiety, and depression among healthcare workers managing COVID-19 pandemic in India: A nationwide observational study. *Indian Journal of Psychological Medicine, 42*(4), 353–358. https://doi.org/10.1177/0253717620933992

World Health Organization. (2020) Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations: scientific brief, 29 March 2020.

Ying, Y., Kong, F., Zhu, B., Ji, Y., Lou, Z., & Ruan, L. (2020). Mental health status among family members of health care workers in Ningbo, China during the Coronavirus Disease 2019 (COVID-19) outbreak: a Cross-sectional Study. *BMC Psychiatry, 20*(379), 1–10. https://doi.org/10.1186/s12888-020-02784-

Zhong, B. L., Luo, W., Li, H. M., Zhang, Q. Q., Liu, X. G., Li, W. T., & Li, Y. (2020). Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *International Journal of Biological Sciences, 16*(10), 1745–1752. https://doi.org/10.7150/ijbs.45221