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The Effects of COVID-19 on the Socio-Economic Conditions of Marginal People: A Case Study in the Selected Districts of Bangladesh

Mohammad Mafizur Rahman [1] and Khosrul Alam [2,*]

[1] School of Business, University of Southern Queensland, Toowoomba 4350, Australia
[2] Department of Economics, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj 8100, Bangladesh
* Correspondence: alam.khosrul@bsmrstu.edu.bd

Abstract: In this paper, we have examined the effects of COVID-19 on the socio-economic condition of the three-wheeled electric vehicle drivers in some selected areas of Bangladesh from the cross-sectional data (September–November 2020). The results of linear regression indicate that under COVID-19 conditions, age ($p = 0.022$) and hardship ($p = 0.000$) positively, and education ($p = 0.036$), driving duration ($p = 0.023$), COVID consciousness ($p = 0.086$) and easy bike vehicle ($p = 0.000$) negatively affects income of the respondents. The deaths of COVID in the district ($p = 0.003$), income ($p = 0.000$), age ($p = 0.037$), easy bike vehicle ($p = 0.018$), debt ($p = 0.059$) and sufferings of diseases ($p = 0.044$) positively, and property holdings ($p = 0.028$), residence in urban areas ($p = 0.004$) and COVID consciousness ($p = 0.082$) negatively affect the family expenditure. The results from binary logistics regressions show that diseases sufferings (adjusted $p = <0.001$; unadjusted $p = <0.001$), corona fear (unadjusted $p = 0.005$; adjusted $p = <0.001$) have positive, and income (unadjusted $p = <0.001$; adjusted $p = <0.001$), cooking fuel (unadjusted $p = 0.003$; adjusted $p = 0.091$) and easy bike vehicle (unadjusted $p = <0.001$; adjusted $p = 0.288$) have negative association with hardship or misery due to COVID-19; death of COVID-19 in the district (unadjusted $p = 0.008$; adjusted $p = 0.037$), hardship or misery (adjusted $p = 0.005$; adjusted $p = 0.001$), and urban dwelling area (unadjusted $p = 0.002$; adjusted $p = 0.004$) have positive, and access to pure drinking water (unadjusted $p = 0.005$; adjusted $p = 0.011$) has negative link with corona fear; and, family savings (unadjusted $p = 0.001$; adjusted $p = 0.013$), satisfaction in the current job (unadjusted $p = <0.001$; adjusted $p = <0.001$), and government medical service (unadjusted $p = 0.065$; adjusted $p = 0.012$) have positive affiliation, and household size (unadjusted $p = 0.007$; adjusted $p = 0.020$) has negative affiliation with the continuation desire of the current job of respondents. All the obtained results are consistent and have significant policy implications.

Keywords: marginal people; socio-economic condition; hardship; COVID-19 fear

1. Introduction

COVID-19 has immense nefarious implications on the daily life of the poor and marginal people all over the world. The mishap created by coronavirus leads to the livelihoods of the people disrupted due to the travel restrictions, clog of international capital flow, and domestic containment policy exacerbating the pre-existing vulnerabilities in the developing countries (WB [1]). The adverse effect of COVID-19 may intensify rural poverty and to overcome this proper remedial measures should be taken for protecting the marginalized people on the earth (FAO [2]). In this context, the rickshaw-pullers live a wretched life without income and food due to the lockdown effect of COVID-19 (Chitlangia [3]). For this reason, the study on identifying the socio-economic status of marginal people (e.g., auto-rickshaw pullers and easy bike drivers) under the condition of

COVID-19 is now a focal point of research interest among contemporary researchers.

In Bangladesh, the impact of COVID-19 on the socio-economic conditions is also found in a harsh way. The dejected condition caused by coronavirus and its dreadful effect also led to uncertainties of the living of the marginal people such as auto-rickshaw pullers and easy bike drivers in this country. Bangladesh as a developing country having small land (130,170 square kilometers) areas but comprising a large population (163.046 million), created heavy pressure on ensuring basic needs for its citizens (WDI [4]). Many people are still living in poverty (24.30% in 2016) and engage in small-scale jobs (WDI [4]). With little wealth and resources, ensuring fundamental necessities for the people becomes quite challenging. The socio-economic conditions of three-wheel drivers are awfully low and dragging for life. The recent COVID-19 exacerbated their life, health, shelter, etc., which deteriorated their conditions further.

Many experimental works have been observed in Bangladesh (see Wadood and Tehsum [5]; Hossain et al. [6]; Islam and Sarker [7]; Begum and Sen [8]; among others) which analyzed the socio-economic conditions of rickshaw pullers; these studies are mostly based on the capital city or other city level and are limited to rickshaw pullers only. However, at the present time, most rickshaw pullers have shifted towards electricity-led vehicles. Now, under the coronavirus situation, the consideration of the socio-economic status of these electricity-led three-wheel drivers (e.g., auto-rickshaw pullers and easy bikes, etc.), will be an important research topic. These people are considered as marginal people, and under the COVID-19 situation, no study has been conducted on these people in Bangladesh. Therefore, we have taken an endeavor to fill up the existing literature gap in this study.

The central objectives of this study are as under:

- To find out the socio-economic status of three-wheeled electric vehicle drivers in the selected areas of Bangladesh.
- To inspect the determinants of earnings of the three-wheeled electric drivers by using the OLS method.
- To identify the implications of COVID-19 on their socio-economic status.
- To analyze the socio-economic factors that create misery for the electricity-led three-wheel drivers under COVID-19 by using logistic regression analysis.
- To put forward some policy recommendations for improving their condition under the present coronavirus situations.

The main contributions of this paper are: (a) this is the first ever study in Bangladesh, to the best of our knowledge, that deals with the socio-economic condition of electricity-led three-wheel drivers considering both auto-rickshaw and easy bikes; (b) under the disastrous event of COVID-19 pandemic, socio-economic conditions of these people are identified; (c) our findings are authentic based on primary survey data conducted by the researchers; (d) the estimated vigorous results of the study will help the policy makers not only in Bangladesh but also in the other developing countries to make effective policies for the marginal people.

The rest of the paper is organized as follows: following the introduction, Section 2 analyzes the literature reviews; Section 3 explains the data and methodology; Section 4 provides the results; Section 5 depicts the discussions, and Section 6 presents the conclusion and policy recommendations.

2. Literature Review

As three-wheeled cars such as rickshaws, auto-rickshaws, easy bikes, etc., are more prevalent in the Indian sub-continent, a good deal of work (see Harding et al. [9], 2016; Ali [10]; Nandhi [11]; Khan [12], 2012; among others) related to the socio-economic status of the three-wheeled vehicle, especially rickshaw drivers are found in this region. In this line, Harding et al. [9] made a study on the auto-rickshaws of Indian cities in the context of public perceptions and operational realities, where they found that the truths of au-

to-rickshaw operation are extremely challenging and made the family of rickshaw-puller under the poverty line. Similarly, Ali [10] tried to investigate the socio-economic analysis of rickshaw pullers in urban centers of Uttar Pradesh, India. From the data of field survey in 2006–2007 of 200 individuals, they obtained that the rickshaw pullers are migrated from rural areas, illiterate, and their dwelling place is absent of civil facilities. He suggested that the rickshaw puller require to be treated as a backward community and adequate facilities for them should be ensured to end their problem. Nandhi [11] also conducted a study on the cycle rickshaw puller in Delhi to address the urban poor and their money, where they found the backwardness of the living of cycle rickshaw pullers and recommended to facilitate financial access for them for proper management of their money. In the same way, Khan et al. [12] attempted to analyze the socio-economic characteristics of cycle rickshaw pullers and trace out the reasons for rickshaw pulling from the primary data of a field survey in 2010 of over 100 respondents. They attained that the rickshaw pullers are one of the poorest sections of the society, living in abject poverty but play a key role in the intra-city transportation system.

Some experimental works related to the socio-economic conditions of three-wheeled vehicles drivers especially rickshaw pullers also exist in Bangladesh (see Hasan [13]; Karim and Salam [14]; Hossain et al. [15]; Wadood and Tehsum [5]; Hossain et al. [15]; Islam and Sarker [7]; Begum and Sen [8]; among others). In this context, Hasan [13] conducted a study on the economic evaluation of rickshaw pulling in Dhaka city under the inspection of internal migration and employment in Bangladesh. From the field survey in 2014, the data of 127 individuals, and applying various econometric techniques such as probability density function, benefit–cost analysis and descriptive exploration, he found that higher income draws rickshaw pullers from the rural areas to urban areas and with family migration ensures more financial gains, but most of them are living single and their socio-economic condition is deteriorating. Similarly, from the survey data of 200 respondents in Dhaka city, Karim and Salam [14] found that the rickshaw pullers live under extreme poverty, have low land, consume unsafe food and water, and live in a dreadful housing. The study of Hossain et al. [15] showed generational differences and the link of income with age and marital status of the rickshaw pullers. Wadood and Tehsum [5] conducted a study on the vulnerabilities of the cycle rickshaw pullers of Dhaka city of Bangladesh. From primary survey data of 120 individuals, where OLS and Probit regression models are used, they have derived the income determinants, current living conditions, livelihood strategies, shocks and insurances against shocks of the cycle rickshaw pullers. They also found that working hour and crop homeland have positive, and rickshaw ownership and age have negative effect on the income of cycle rickshaw puller, whereas the seasonal drivers want to change their profession most. The study of Hossain et al. [6]) on 250 respondents found that most of the rickshaw pullers are poor rural people, illiterate, migrated, lived in a poor dwelling or in a slum, and recommended providing extra care for them. Islam et al. [16] also tried to assess the socioeconomic information, health status, and nutritional knowledge of rickshaw pullers from the descriptive cross-sectional study of 50 rickshaw pullers in Hugra Union in Tangail District. They found that the socio-economic factors pushed 56% of the rickshaw pullers into pulling rickshaws and consuming minimum socio-economic facilities with their lower level of income. They recommended for essential socio-economic conveniences be provided under poverty alleviation programs of the government. Sadekin et al. [17] conducted a socioeconomic analysis on the migrated rickshaw pullers in Comilla city of Bangladesh. From the field survey in 2014 of over 150 individuals, they found that the people chose rickshaw pulling because it is an easy way of earning more money and employment but their social, economic and livelihood status of them are not satisfactory in the long run. They recommended government intervention to improve this sector. Islam and Sarker [7] also performed a study on 80 rickshaw pullers in Sylhet metropolitan area and found that temporary migration among them where educational qualification is negatively related to their earnings but after migration, their household consumption

expenditure increased. In the same way, Begum and Sen [8] pointed out that rickshaw pulling may help them to escape from extreme rural poverty in the short run but in the long run, the income poverty gets deteriorated with the length of involvement in rickshaw pulling. According to them, the rickshaw pulling provides no eternal route to evading poverty.

From the above literature, it is found that all the studies analyzed the socio-economic status, income pattern, and migration behavior of rickshaw pullers. As of now, electric-led three-wheel vehicles such as auto-rickshaw, easy bikes, etc., are dominating in the short-distanced transportation system which is found absent in their works. So, our study is an inclusive effort to fill up the existing literary gap by analyzing the socio-economic conditions of the auto-rickshaw and easy bike drivers in the selected areas of Bangladesh during the event of disastrous pandemic COVID-19 as a consideration of marginal people.

3. Methods

3.1. Data, Study Area and Sample Selection

This is a cross-sectional study based on the field survey in randomly selected districts and respondents (see Appendix B). The information is collected by providing structured questionnaires prepared by the researchers. The researchers nominated some people to collect the data, and then the authors compiled and cleaned the data and analyzed it. The study period was from September to November 2020. A total of 470 respondents took participation and give their full information. Participants were also given assurance about keeping the data anonymous and the right to provide information willingly.

Some information regarding the corona infection and death was also collected from the news of Ekattor television [18] live update of Bangladesh (see Appendix A).

3.2. Concepts about Electricity Led Three Wheel Vehicles

With the advent of electricity, there are many people who run electricity-led three-wheeled vehicles (the total number is unknown due to many unlisted drivers). In Bangladesh mostly well-run three-wheel cars are named easy bike and auto-rickshaw. Easy bike is a three-wheeled car that is run by electricity and used for carrying six to seven passengers, whereas an auto-rickshaw is also an electricity-led three-wheeled vehicle used to carry usually one or two passengers. For traveling short distances these vehicles are more prevalent in the local areas of Bangladesh.

3.3. Variables

In this study, the used economic variables are income per day, daily working hour, daily leisure hour, family expenditure, savings of the family, access to credit, and ownership of vehicles; the social variables are household size, years of schooling as a proxy for education, age, type of vehicle, debt, having property, ownership of vehicle, duration of driving, ownership of housing, living in urban or rural areas, satisfaction in the present profession, desire to continue current job, access to electricity, access to pure drinking water, use of cooking fuel, fully pucca toilet, and help from government. The health-related variables are the number of coronavirus infected and death, smoking habit, suffering from any diseases, use of medical service, hardship or misery due to COVID-19, fear of corona, consciousness of coronavirus, and health cost per month of the respondents.

3.4. Statistical Analysis

For empirical estimation, we have used two renowned statistical software packages such as SPSS version 25.0, and STATA-15. In this study, we have analyzed descriptive statistics with SPSS, and linear and binary logistic regressions with STATA. These ap-

proaches also belonged to some limitations such as probability distribution, Gaussian distribution, 95% confidence interval dogma, and false positive problems (Tormählen et al. [19]).

4. Results and Analysis

4.1. Descriptive Statistics

The socio-economic profile of the respondents in the study area is displayed in Table 1. It is observed that the mean age of easy bike drivers and auto-rickshaw pullers are, respectively, 32.98 and 35.23 years, respectively. The mean education of easy bike drivers and auto-rickshaw pullers is 6.69 years and 5.36 years in terms of years of schooling. The mean household size of them is 5.19 and 4.97 successively. As both groups belonged to a marginal level, the mean earnings per day, average family expenditure per day, per day family savings, and monthly average family health cost of easy bike driver are Bangladeshi Taka, BDT 572.222, BDT 310.714, BDT 40.637, and BDT 1437.82, respectively. Similarly, per day earnings, per day family expenses, per day family savings, and per month health expenditure of auto-rickshaw pullers are BDT 413.178, BDT 252.797, BDT 30.903, and BDT 1364.83. These people also face problems in getting access to credit as 62.40% of easy bike drivers and 53.40% of auto-rickshaw drivers will get the opportunity of a loan if they desire. In terms of vehicle ownership, 76.5% of easy bike drivers and 81.4% of auto-rickshaw drivers owned their vehicle, and the rest of the drivers rented to earn their income. Most of these people also fall into debt as 63.5% of easy bike drivers and 53.4% of auto-rickshaw pullers declared that they are in debt of any kind. In terms of property holding, 69.7% of easy bike drivers and 66.9% of auto-rickshaw pullers own their family property. In the case of a dwelling, 83.3% of easy bike drivers and 88.1% of auto-rickshaw drivers are living in a village area, and the percentage who own their residence of 88.5% and 87.7%, respectively.

Table 1. Socio-economic profile of the respondents.

Characteristics	Easy Bike Driver *n* (%)	Auto-Rickshaw Puller *n* (%)
Number of respondents	234 (49.79)	236 (50.21)
Mean age	32.98	35.23
Mean education	6.69	5.36
Mean household size	5.19	4.97
Mean income per day (in BDT)	572.222	413.178
Mean family expenditure per day (in BDT)	310.714	252.797
Mean savings per day (in BDT)	40.637	30.903
Mean health cost per month (in BDT)	1437.82	1364.83
Marital status	Unmarried: 28 (12) Married: 206 (88)	Unmarried: 28 (11.9) Married: 208 (88.1)
Access to credit	No: 88 (37.6) Yes: 146 (62.4)	No: 110 (46.6) Yes: 126 (53.4)
Vehicle ownership	Rented: 55 (23.5) Owned: 179 (76.5)	Rented: 44 (18.6) Owned: 192 (81.4)
Debt	No: 85 (36.3) Yes: 149 (63.5)	No: 110 (46.6) Yes: 126 (53.4)
Having Property	No: 71 (30.3) Yes: 163 (69.7)	No: 78 (33.1) Yes: 158 (66.9)
Residence ownership	Rented: 27 (11.5) Owned: 207 (88.5)	Rented: 29 (12.3) Owned: 207 (87.7)

Access to pure water	No: 40 (17.1)	No: 39 (16.5)
	Yes: 194 (82.9)	Yes: 197 (83.5)
Dwelling area	Village: 195 (83.3)	Village: 208 (88.1)
	Town: 39 (16.7)	Town: 28 (11.9)
Access to electricity	No: 6 (2.6)	No: 7 (3.0)
	Yes: 228 (97.4)	Yes: 229 (97.0)
Fuel for cooking	Wood: 198 (84.6)	Wood: 221 (93.6)
	LPG: 36 (15.4)	LPG: 15 (6.4)
Use fully pucca toilet	Others: 62 (26.5)	Others: 102 (43.2)
	Fully Pucca: 172 (73.5)	Fully Pucca: 134 (56.8)
Receive govt. help	No: 182 (77.8)	No: 181 (76.7)
	Yes: 52 (22.2)	Yes: 55 (23.3)
Smoking habits	No: 92 (39.3)	No: 106 (44.9)
	Yes: 142 (60.7)	Yes: 130 (55.1)
Suffering diseases	No: 170 (72.6)	No: 168 (71.2)
	Yes: 64 (27.4)	Yes: 68 (28.8)
Consciousness about COVID-19	No: 64 (27.4)	No: 73 (30.9)
	Yes: 170 (72.6)	Yes: 163 (69.1)

In availing different social facilities, it is noted that for the electricity facilities, access to pure drinking water, and use of fully pucca toilet the easy bike driver belongs to 97.4%, 82.9%, and 73.5% successively out of total easy bike driver respondents, whereas these facilities consumed by auto-rickshaw drivers are 97.0%, 83.5%, 56.8%, respectively, out of total auto-rickshaw driver respondents. In terms of fuel used for cooking it is found that only 36% of easy bike drivers and 6.4% of auto-rickshaw pullers use liquid purified gas (LPG) and the rest of these people use wood. Only 22.2% of easy bike drivers and 23.3% of auto-rickshaw pullers receive government help. With regard to the smoking habit, 60.7% of easy bike drivers and 10% of rickshaw pullers smoke. In terms of the suffering from different diseases, 27.40% of easy bike drivers and 28.80% of auto-rickshaw pullers declared that they suffer from various diseases. From Table 1 it is also found that 72.6% of easy bike drivers and 69.10% of auto-rickshaw pullers have consciousness of the COVID-19 pandemic, and the rest of them have no awareness regarding this.

4.2. Effects of COVID-19 Pandemic on Economic Status

The picture of some economic variables such as income, family expenditure, savings, work hours, leisure, and family health cost before and after COVID-19 is depicted in Table 2. It is noticed that the economic status of these marginal people is adversely affected in various ways due to the pandemic. The declared mean income per day before COVID-19 was BDT 683.638 and after COVID-19 this becomes BDT 492.362, which shows a remarkable decrease. Similarly, the declared daily family expenditure and daily savings before the COVID-19 pandemic were BDT 293.506 and BDT 59.983, respectively, which also decreased after the COVID-19 pandemic to BDT 281.632 and BDT 35.749, respectively. The working hour per day decreased but the daily leisure hour increases due to this pandemic. Before the pandemic, the declared daily working hours and leisure hours were 9.46 and 2.67, whereas after the pandemic these become 8.79 and 3.29, respectively. On the other hand, the declared average health cost per month is increased due to COVID-19, as this was BDT 1304.85 before COVID-19 and after the pandemic, this becomes BDT 1401.17.

Table 2. Picture of some economic variables before and after COVID-19 pandemic.

Characteristics	Before COVID-19	After COVID-19	*p*-Value
Mean income per day (in BDT)	683.638	492.362	<0.001
Mean family expenditure per day (in BDT)	293.506	281.632	0.057
Mean family savings per day (in BDT)	59.983	35.749	<0.001
Mean work hour per day	9.46	8.79	0.006
Mean leisure per day	2.67	3.29	<0.001
Mean health Cost per month (in BDT)	1304.85	1401.17	<0.001

4.3. Determining Factors of Income and Expenditure Under COVID-19 Condition

In Table 3, the income determining factors under the COVID-19 pandemic condition is displayed. It is found that the coefficients of age and hardship due to COVID-19 are −0.135 and −0.369, which are negative and statistically significant at 5% and 1% levels, respectively. The coefficients of education, driving duration, and COVID-19 consciousness are 0.056, 0.045, and 0.055, which are positive and statistically significant at 5%, 5%, and 1% levels, respectively.

Table 3. Income determining factors under COVID-19. (Dependent variable: lnIncome (After COVID)).

Variables	Coefficients	Standard Errors	*t*	*p* > |*t*|
lnAge	−0.135 **	0.059	−2.30	0.022
lnEdu	0.056 **	0.027	2.10	0.036
lnDriv Duration	0.045 **	0.019	2.28	0.023
COVID Consciousness (Yes = 1; No = 0)	0.055 *	0.032	1.72	0.086
COVID Hardship (Yes = 1; No = 0)	−0.369 ***	0.030	−12.25	0.000
Vehicle type (Easy Bike = 1; Auto-Rickshaw = 0)	0.246 ***	0.030	8.10	0.000
Constant	6.482 ***	0.210	30.83	0.000

*, **, *** denote, respectively, 10%, 5% and 1% level of statistical significance.

Similarly, the family expenditure determining factors under COVID-19 is portrayed in Table 4. It is noted that the coefficient of death in districts due to COVID-19 is 0.059 which is positive and statistically significant at a 1% level, implying that death due to COVID-19 positively affects family expenditure. The coefficients of income and age are 0.334 and 0.139, which are positive and statistically significant at 1% and 5% levels, consecutively. It is also noted that the easy bike driver spends more on family expenditure-related activities in which the coefficient is 0.101 and statistically significant at a 5% level. The coefficients of debt, property, and residence are 0.076, −0.097, and −0.180, which are statistically significant at 10%, 5%, and 1%, successively.

Table 4. Family expenditure determinants after COVID-19. (Dependent variable: lnFamExpenditure (AfterCOVID)).

Variables	Coefficients	Standard Errors	*t*	*p* > |*t*|
lnCOVID death	0.059 ***	0.019	3.00	0.003
lnIncome	0.334 ***	0.053	6.28	0.000
lnAge	0.139 **	0.067	2.09	0.037

Vehicle type (Easy Bike = 1; Auto-Rickshaw = 0)	0.101 **	0.043	2.37	0.018
Debt (Yes = 1; No = 0)	0.076 *	0.039	1.89	0.059
Property (Yes = 1; No = 0)	−0.097 **	0.044	−2.20	0.028
Residence (Yes = 1; No = 0)	−0.180 ***	0.063	−2.87	0.004
Suffering Diseases (Yes = 1; No = 0)	0.088 **	0.043	2.02	0.044
COVID Consciousness (Yes = 1; No = 0)	−0.075 *	0.043	−1.75	0.082
Constant	2.942 ***	0.415	7.09	0.000

*, **, *** denote respectively, 10%, 5% and 1% level of statistical significance.

It is observed that the coefficients of suffering diseases and COVID consciousness are 0.088 and −0.075, which are statistically significant at 5% and 1% levels, respectively, where the suffering of diseases is affected positively, and COVID-19 consciousness negatively affects the family expenditure of respondents in the study areas. Thus, the positive impact of disease suffering implies that it leads the people to purchase extra pre-cautionary items for preventing the havoc of coronavirus, whereas the corona-conscious people face fewer complications of diseases that reduce family expenditures.

4.4. Effects of COVID-19 on Hardship or Misery, Fear, and Continuation of Current Job

Table 5 displays the results of binary logistic regression on the self-declared condition of hardship or misery of the respondent and its associating factors under the COVID-19 pandemic. It is found that both the unadjusted and adjusted odd ratios of income after COVID shows negative (OR = 0.993, 95% CI = 0.991–0.994, $p < 0.001$; AOR = 0.992, CI = 0.990–0.993, $p < 0.001$), diseases sufferings show positive (OR = 2.201. 95% CI = 1.423–3.403, $p < 0.001$; AOR = 2.924, 95% CI = 1.664–5.139, $p < 0.001$), COVID fear shows positive (OR = 1.829, 95% CI = 1.205–2.778, $p = 0.005$; AOR = 3.776, 95% CI = 2.237–6.672, $p < 0.001$), cooking fuel shows negative (OR = 0.407, 95% CI = 0.224–0.738, $p = 0.003$; AOR = 0.507, 95% CI = 0.231–1.115, $p = 0.091$), vehicle type shows mixed (OR = 0.475, 95% CI = 0.327–0.691, $p < 0.001$; AOR = 1.307, 95% CI = 0.797–2.143, $p = 0.288$) associations with hardship or misery of the respondents in the study area.

Table 5. Logistic regression analysis of facing hardship or misery.

Hardship Due to COVID-19 (COVID Hardship (Yes = 1; No = 0))						
	Unadjusted Model			**Adjusted Model**		
Variables	**Odds Ratio (OR)**	**95% Confidence Interval (CI)**	***p* Value**	**Adjusted Odds Ratio (AOR)**	**95% Confidence Interval (CI)**	***p* Value**
Income (After COVID)	0.993	0.991–0.994	<0.001	0.992	0.990–0.993	<0.001
Suffering Diseases (Yes = 1; No = 0)	2.201	1.423–3.403	<0.001	2.924	1.664–5.139	<0.001
COVID fear (Yes = 1; No = 0)	1.829	1.205–2.778	0.005	3.776	2.237–6.672	<0.001
Cooking Fuel LPG = 1; Wood = 0)	0.407	0.224–0.738	0.003	0.507	0.231–1.115	0.091
Vehicle type	0.475	0.327–0.691	<0.001	1.307	0.797–2.143	0.288

| (Easy Bike = 1; Auto-Rickshaw = 0) | | | | | | |

In terms of COVID-19 fear, Table 6 displays the results of the binary logistics of fear of the respondents in the study area due to COVID-19 and its associating factors. It is noted that under both unadjusted and adjusted odd ratios the COVID death (OR = 1.008, 95% CI = 1.002–1.014, *p* = 0.008; AOR = 1.006, 95% CI = 1.000–1.012, *p* = 0.037), COVID hardship (OR = 1.829, 95% CI = 1.205–2.778, *p* = 0.005; AOR = 2.056, 95% CI = 1.332–3.175, *p* = 0.001) and dwelling area (OR = 4.059, 95% CI = 1.708–9.651, *p* = 0.002; AOR = 3.676, 95% CI = 1.513–8.929, *p* = 0.004) have positive, and pure drinking water access (OR = 0.366, 95% CI = 0.182–0.735, *p* = 0.005; AOR = 0.391, 95% CI = 0.190–0.803, *p* = 0.011) has negative affiliation with corona fear created due to COVID-19.

Table 6. Logistic regression analysis about getting fear among the respondent.

COVID-19 Fear among the Respondent (Yes = 1; No = 0))						
	Unadjusted Model			**Adjusted Model**		
Variables	**Odds Ratio (OR)**	**95% Confidence Interval (CI)**	***p* Value**	**Adjusted Odds Ratio (AOR)**	**95% Confidence Interval (CI)**	***p* Value**
COVID death	1.008	1.002–1.014	0.008	1.006	1.000–1.012	0.037
COVID Hardship (Yes = 1; No = 0)	1.829	1.205–2.778	0.005	2.056	1.332–3.175	0.001
Dwelling Area (Town = 1; Village = 0	4.059	1.708–9.651	0.002	3.676	1.513–8.929	0.004
Pure Water (Yes = 1; No = 0)	0.366	0.182–0.735	0.005	0.391	0.190–0.803	0.011

In terms of the continuation choice of the current profession the binary logistic outcomes of the respondents and its linking factors are displayed in Table 7. Under both unadjusted and adjusted odd ratios, the household size (OR = 0.770, 95% CI = 0.639–0.929, *p* = 0.007; AOR = 0.776, 95% CI = 0.626–0.961, *p* = 0.020) has negative affiliation, whereas family savings (OR = 1.023, 95% CI = 1.009–1.037, *p* = 0.001; AOR = 1.019, 95% CI = 1.004–1.035, *p* = 0.013), satisfaction in current profession (OR = 10.545, 95% CI = 5.066–21.952, *p* < 0.001; AOR = 10.461, 95% CI = 4.833–22.639, *p* < 0.001), and government medical service (OR = 2.056, 95% CI = 0.956–4.421, *p* = 0.065; AOR = 3.219, 95% CI = 1.292–8.017, *p* = 0.012) have positive affiliation with the continuation decision of the respondents in the studied area.

Table 7. Logistic regression analysis about desire to continue.

	Unadjusted Model			**Adjusted Model**		
Variables	**Odds Ratio (OR)**	**95% Confidence Interval (CI)**	***p* Value**	**Adjusted Odds Ratio (AOR)**	**95% Confidence Interval (CI)**	***p* Value**
Household Size	0.770	0.639–0.929	0.007	0.776	0.626–0.961	0.020
Family Savings	1.023	1.009–1.037	0.001	1.019	1.004–1.035	0.013
Satisfaction (Yes = 1; No = 0)	10.545	5.066–21.952	<0.001	10.461	4.833–22.639	<0.001
Medical Service Govt. = 1; Private = 0)	2.056	0.956–4.421	0.065	3.219	1.292–8.017	0.012

5. Discussion

Under the COVID-19 pandemic situation, the respondents in the study area are leading their life in a tough way due to decreased income, increased family expenditure, increased hardship or misery, and increased fear of coronavirus. As noted in Table 3, the age and hardship, due to the pandemic, inversely affect the earnings of the respondents. If age increases the working capacity gets lower and thus incomes decreased accordingly. COVID-19 hardship or misery creates various disincentives to earn less in the present pandemic condition. The increased duration of driving makes the respondents experience, the education increases their consciousness, and COVID-19 consciousness makes them safe from the present pandemic.

Table 4 delineates that the number of deaths due to COVID-19 affects family expenditure positively, which may be due to the increased price of goods because of low supply due to lockdown. The variables such as income after COVID-19 show a positive impact on family expenditure indicating that the income earners have to purchase more different items for the family increasing the extra burden under the pandemic condition, this increases family expenditure. Similarly, family expenditure also increases with the increase in age due to extra medical costs. The family expenditure also increases with the increase in debt to repay the installment, whereas the property holders may compensate for their expense from their family property, and the residence holders need not bear the extra cost of rent, which reduces family expenditures.

In Table 5, it is noted that the odd ratios of the result of binary logistic regression imply that income after COVID-19 reduces hardship or misery of the respondent, as it gives money and strength to combat misery under corona situation. The suffering of diseases also increases misery or hardship by creating fear, different health-related complications, and health costs under COVID-19 situations. The fear of coronavirus also increases misery in the study areas by increasing concern of health and economic burden, as the price of goods and services increases with the increase of corona fear. The decision of cooking fuel with liquefied petroleum gas (LPG) reduces the misery or hardship by affecting the environment negatively, whereas wood affects the environment by emitting smoke and creates different flu-related diseases in the respondent. In terms of vehicle type, the easy bike driver faces less misery than auto-rickshaw drivers due to more earnings.

Table 6 indicates that the death due to COVID-19 increases the corona fear among the respondents. COVID-19 hardship or misery also affects the respondents to increase their fear of the respondents about coronavirus. The people in town areas fear more corona than village people. Access to pure drinking water facilities reduces the fear of COVID-19.

Under the COVID-19 situation, many people are afraid of continuing their usual daily work. In this respect, Table 7 shows that household size negatively affects the continuation of the current profession due to lower income from the job. The family savings of the respondents in the study area provides positive incentives for continuing this profession. Above all, the satisfaction of the chosen profession also significantly affects the continuation of the present job. Similarly, increased government medical facilities encourage people to continue their current profession.

6. Conclusions and Policy Recommendations

In this paper, we have examined the impacts of COVID-19 on the socio-economic condition of the three-wheeled electric vehicle drivers in some selected areas of Bangladesh. From the cross-section data (September–November 2020), we have employed descriptive analysis, and linear and logistic regressions to estimate our results. From linear regression, we have obtained that under COVID-19 conditions age and hardship positively, education, driving duration, COVID consciousness, and vehicle type (easy bike driving) negatively affect the income of the respondents. The number of deaths due to

COVID-19 in the districts, income, age, vehicle type (easy bike), debt and suffering of diseases positively, property holdings, residence in urban areas, and COVID consciousness negatively affect the family expenditure of the respondents in the study areas. From binary logistics regressions we have identified that diseases sufferings, corona fear have positive, and income, cooking fuel, and vehicle type (easy bike) have a negative association with hardship or misery due to COVID-19; death due to COVID-19 in the district, hardship or misery, and dwelling area (urban) have positive, and access to pure drinking water has a negative link with corona fear of the respondents, and family savings, satisfaction in the current profession, and medical service (government) have a positive affiliation, and household size has a negative affiliation with the continuation desire of current job of the respondents in the study areas. All the results attained by estimation are consistent and have significant policy implications. The policy significance of the outcomes is that the improvement of the quality of the socio-economic condition of the marginal people needs to be ensured by formulating proper policy initiatives under the COVID-19 condition. In this respect, the following specific actions should be undertaken on a priority basis.

   i. Creating awareness about COVID-19: Massive awareness relating to COVID-19 should be created among marginal people. All steps regarding the mitigation of corona fear may be helpful for the marginal people to combat it and run their lives in a conscious way such as using masks, maintaining social distancing, washing hands, and abiding by rules as prescribed by the ministry of health of the country and World Health Organization (WHO). In this respect, different programs relating to corona consciousness such as posters, banners in educational, religious, and public institutions, and advertisements through television and newspaper can play wider roles.

  ii. Ensuring safety net for the marginal people: As the marginal people in the country are living mishap life under COVID-19 situations, a number of safety net programs to save them are urgently required. In this regard, different earnings support schemes, old age benefits for poor people, job-keeper subsidies to employers, etc., can be helpful in leading their normal lives during pandemic situations.

 iii. Medical facilities: In terms of medical facilities, the government health services should be improved and extended so that the marginal people can get quality services at a cheaper cost easily. For this reason, different types of public health care facilities should be expanded to the community level along with qualified doctors, nurses, and modern technologies.

 iv. Social facilities: Different social facilities and opportunities should be created and extended for the marginal people. In this regard, mental support programs, counseling services, a satisfaction increasing program, access to pure drinking water facilities, food support programs, etc., should be arranged for marginal people to lead their normal life under the COVID-19 pandemic condition.

7. Limitations

The present study is conducted with cross-sectional data limited to small areas and a small number of samples. The respondents also feel shy, unwilling, and fearful in giving their proper information. Hence, we could not include some other variables that may be relevant for this study. Future research on this issue with additional variables and respondents covering large areas is encouraged to facilitate effective policies.

Author Contributions: M.M.R. contributed to conceptual and methodological development, variable selection, result analysis, writing abstract, polishing and editing, and improving the quality of the manuscript, and overall carefully supervising. K.A. made study plan, literature review, data collection, writing main sections of the paper, econometric estimation, and data and result analysis,

undertaking the responsibility of corresponding author of this paper. All authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement: For conducting this study a signed permission from the respondents is taken. Respondents were informed the method, nature, and purpose of the study, and also assured that their information would be kept confidential. They were also guaranteed that they can retain or withdraw their information. The detailed methods of collecting data, participants' rights, data security and privacy were given as per to the Helsinki Declaration 1975.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data will be provided upon request by the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Total number of infected and death due to COVID-19.

District	Number of Respondents	Total of COVID Infected as of 16 November 2020	Total of COVID Death as of 16 November 2020
Bagerhat	20	1014	26
Bagura	10	8371	196
Barisal	20	4157	75
Chuadanga	10	1540	41
Dhaka	10	131,608	2618
Dinajpur	10	3815	89
Faridpur	30	7478	95
Gaibandha	10	1259	14
Gopalganj	40	2762	34
Habiganj	10	1871	16
Jamalpur	10	1694	24
Jashore	30	4227	50
Jhalakathi	10	755	18
Jhenaidah	20	2137	37
Joypurhat	10	1163	7
Khulna	70	6760	103
Kurigram	10	951	15
Lalmonirhat	20	909	9
Magura	20	980	19
Narail	10	1451	20
Natore	20	1088	12
Nilphamari	20	1177	21
Pirojpur	10	1121	24
Rajbari	10	3219	24
Rajshahi	20	5321	50
Rangpur	10	3248	52
Total	470	200,076	3689

Sources: Field survey-2020; Ekattor TV news (16 November 2020).

Appendix B

For study purpose only (Questionnaire on Easy bike/Auto-rickshaw drivers) Date:……………

A. Personal information
1. Name:
2. Age:
3. Village:
4. Upazilla:
5. District:
6. Main occupation:
7. Education level (Years of schooling):
8. Marital Status: (i) Married (ii) Unmarried
9. Family Members:

B. Economic/financial information
1. Vehicle type: (i) Easy bike (ii) Auto-rickshaw
2. Ownership of vehicle: (i). Personal (ii). Rented
3. (If personal) Sources of money for purchasing vehicle: (i) Own money (ii) Loan
4. Access to credit: (i) Yes (ii) No
5. Any debt: (i) Yes   (ii) No
6. Family property: (i) Yes (ii) No
7. Economic variables before and after COVID-19 condition:

8. Duration of driving (in years):…………….
9. Why did you come this profession?...............................
10. What do you think about your profession under current situation?   (i) Continue (ii) Discontinue
Why?...
11.   Are you satisfied with the work: (i) Yes (ii) No
12. Do you want to quit this work: (i) Yes   (ii) No
If yes then why…………………….

C. Social information
1. Ownership of residence: (i) Own (ii) Rented
2. Dwelling area: (i) Town (ii) Village
3. Facilities of pure drinking water: (i) Yes (ii) No
4. Electricity facility: (i) Yes (ii) No
5. Use of fuel for cooking: (i) Wood (ii) LPG
6. Type of Toilets: (i) Kacha (ii) Pucca
7. Children sent to School: (i) Yes (ii) No
8. Types of School study the Children: (i) Government (ii) Private
9. Occupation of wife: (i) Housewife (ii) Working
10. Receive help from government: (i) Yes (ii) No
11. Membership of association: (i) Yes (ii) No
Name of association:…………………………..
12. Support early marriage of children: (i) Yes (ii) No
13. Having domestic violence in the family: (i) Yes (ii) No
14. If yes, in Q. 13, has domestic increase or decrease after COVID 19?
What percent? ………………..

D. Health related information
1. Total corona condition till date

Items	Before	After	Area	Infected number	Deaths
Income per day			Local area		
Rent cost (if) per day			Upazilla level		
Charging cost per month (if)			District level		
Repairing cost per month (if)					

2. Do you smoke: (i) Yes   (ii) No
3. Do you face hardship or misery due to COVID-19: (i) Yes (ii) No
4. Suffering from any diseases: (i) Yes (ii) No
Disease name……………………………….
5. Medical service: (i) Government (ii) Private
6. Family members affected by corona virus: (i) Yes (ii) No
7. Fear of corona: (i) Yes (ii) No
8. Consciousness about preventing corona: (i)

Yes (ii) No

9. Health cost of family per month:

	Before COVID-19	After COVID-19
License cost per year		
Battery repairing cost per year		
Family expenditure per month		
Family savings per month		
Working hour per day		
Leisure hours per day		

Consent Form

For study purpose only (Questionnaire on Easy-bike/Auto-rickshaw drivers) Date:………

1.	I confirm that I have read and understand the questionnaire above and have answered the asked questions willingly and satisfactorily.	☒
2.	I understand that my participation is voluntary, and I am free to withdraw my information any time without any reasons.	☐
3.	I understand that my given information will be used in the research or study purposes by the researchers.	☐
4.	I understand that my name will not appear in any research works or studies.	☐
5.	I am completely agreed to participate the above study.	☐

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