

Safety measures and sanitation facilities of the fruit vendors during COVID-19 in Bangladesh: a cross-sectional study

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Abstract

This study aimed to find the factors affecting the fruit vendor's safety measures and sanitation facilities during COVID-19 in Bangladesh. A quantitative research design was used to conduct this study. Random sampling techniques were executed to collect data from 416 fruit vendors through a field survey. The study reveals that 87% of the fruit vendors took safety measures during COVID-19. Most of them had better sanitation facilities at home compared to their workplaces. Their safety measures and sanitation facilities were associated with socioeconomic backgrounds. Age, type of house, place of business, and receiving financial support influenced fruit vendors' safety measures. Sanitation facilities at home were affected by their sex, schooling, types of houses, and working hours. Types of houses, family income, and business duration impacted the workplace's sanitation facilities. Their socio-demographic and economic situations affected fruit vendors' safety measures and sanitation facilities during COVID-19. Fear of death and government market mechanisms also might have played a significant role in measuring the different steps against Coronavirus infection. Health and hygiene rules prescribed by the authorities should be followed strictly to avoid dire situations during the pandemic. Both government and non-government initiatives should be given the utmost priority to create sanitation awareness, whether about personal cleanliness or workplace hygiene and paired with financial support.

1. INTRODUCTION

The COVID-19 outbreak has shaken the whole world and caused a tumultuous situation. Alongside the health sector, almost every segment of our lives has been obstructed by detrimental impacts on a global scale. Bangladesh is not out of it as this middle-income country was also adversely affected by this pandemic. Many health systems and facilities in the country were found in fragile conditions in terms of safety and sanitation, particularly for those who belong to the informal job sectors with middle and lower income. The informal non-agricultural industry has played a significant role, mainly in urban areas (Suraiya & Noor, 2012). This sector is considered a prime source of employment; it contributes to poverty eradication and earnings that constitute a large proportion of urban economies (Martinez et al., 2017). In urban areas, informal workers typically include the self-employed ones working on the streets or in the open air. Sometimes salaried laborers in informal enterprises or working at their clients' homes; unpaid or meagerly paid family workers; and casual or day laborers.

The fruit vendors are self-employed and sell their products mainly on the street, pivotal during the pandemic when people depended on them for different fruits to boost immunity. The roles of the vendors are ignored, and their vulnerable condition is never

emphasized (Husain et al., 2015). The street fruit vendors are unaware of their health, hygiene, and sanitation (Gwenzi, 2021) because of unconsciousness, illiteracy, and poor socioeconomic background since they practice minimal hygiene and sanitation (Marinthe et al., 2022). On the other hand, the clients are not also conscious of food safety, unsanitary or improper handling practices, cross-contamination from food contact surfaces, insufficient preservation methods, insufficient financial resources to spend on proper equipment, and inadequate education which has a strong connection with spreading foodborne diseases (Mun, 2020; Odeyemi et al., 2019; Das et al., 2022). Unexpectedly, they became the agents of transmitting contagious diseases directly or indirectly. Sanitation and hygiene issues of fruit vendors have never been considered necessary from both the vendor's and the customer's end. Consequently, both suffer greatly, particularly during a pandemic (Elsahoryi et al., 2020). Hygienic practices are in question, and they require more proper knowledge and guidance (Muinde & Kuria, 2005).

A considerable number of studies have been done on fruit vendors, but only some studies on their socioeconomic miseries during the pandemic have been conducted in Bangladesh. Food safety knowledge is understanding food acquired through skills or education (Tuglo et al., 2021). Several studies have claimed that a positive attitude may help to ensure safe food for everyone (Akabanda et al., 2017; Zanin et al., 2017), while attitude may influence behavior and practices (Al-Shabib et al., 2016). In this study, we have set some relevant questions regarding safety measures and sanitation facilities at home and workplace during COVID-19. It will also explore the factors that influence safety measures and sanitation facilities taken by the fruit vendors during the pandemic.

This paper aims to unearth and reveal the myriad influential factors related to fruit vendors' safety and sanitation issues during the pandemic, whether at their workplace or at home. Many people interact with fruit vendors when buying fruits, and there is a possibility that the masses will be infected with coronavirus, especially when dealing with customers. On the other hand, the fruit vendors serve many people by providing fresh fruits in the name of business. These fresh fruits boost the urban community during the pandemic situation. However, during the lockdown period, the economic crisis of the fruit vendors became exhausted as mobility was strictly restricted. This study will also promote safety and sanitation facilities for city dwellers, particularly those who spend most of their time on the street or in public, by securing compatible sanitation facilities to improve their health standards. Formal occupations are treated with high importance comparatively; the non-formal occupation sector should also receive priority for developing urban work environments. It is high time to address the situation; otherwise, a large percentage of city dwellers, along with the vendors, will be affected.

2. METHODOLOGY

2.1. Research design and participants

It was a cross-sectional study and explanatory. In this study, fruit vendors from three different divisions (Khulna, Rajshahi, and Rangpur) of Bangladesh have been communicated to collect data. Some criteria were set up to select fruit vendors in those three divisions, i.e., continuous involvement with this business for at least five years in the same urban areas; the sole owner of the company; open fruit shop during the pandemic; a single source of maintaining the family. Three different divisions (Khulna, Rajshahi, and Rangpur) of Bangladesh were purposively selected for the study. However, the fruit vendors have been chosen through simple random sampling. As any organization needs to determine the number of fruit vendors, it is impossible to mention the exact number in the study area. In addition, the household census was not possible in these three divisions. Finally, data were collected from 416 fruit vendors (Khulna-232, Rajshahi-107, and Rangpur-77).

2.2. Data collection tools and techniques

An interview schedule containing both open and closed-ended questions was prepared for the data collection instrument. Before finalizing the interview schedule, a pilot survey was done on 15 fruit vendors to ascertain the validity and reliability of the data. After the successful completion of that pilot survey, some deductions and additions were incorporated into the schedule. Students of the Sociology Discipline at Khulna University collected data from the field from August to September 2021 in three phases. The first phase was completed within 13 days (Khulna), the second phase took seven days (Rajshahi), and the last phase took more than ten days (Rangpur) due to some problems. Several vital matters were considered when collecting data from the field. As the fruit vendors are to keep themselves busy dealing with customers, students asked them to understand their leisure in between the customers dealing. It was even noticed that they were getting bored when customers asked about the fruit's price, quality, and other relevant issues. Before the interview, their consent was solicited, and they were assured of their dignity and respect. They were also informed that the information they provided would be used only for research purposes. As a face-to-face interaction, the auxiliary information was gathered by looking at significant sources in various study phases.

2.3. Data collection tools and techniques

The data were analyzed by SPSS 25.0 (IBM Corp.), and $p < 0.05$ was deemed significant in all tests. First, percentages, mean, and standard deviation were used to describe the sociodemographic characteristics. Fisher's exact test was also performed to examine the relationship between how fruit vendors seek health and sociodemographic factors. A binary logistic regression was used to assess the influence of sociodemographic factors on their health-seeking ways. For this model, safety measures and sanitation facilities at home and workplace were set as the dependent variable. Sociodemographic factors were age, sex, schooling, marital status, place of residence, family type, type of houses, the status of the dwelling place, working hours per day, family members, earning members of the family, saving, receiving financial support, and taking a loan.

3. RESULTS

3.1. Sociodemographic information

Socio-demographic factors are essential for following safety measures and sanitation management in pandemic situations. [Table 1](#) elucidates the fruit vendors' sociodemographic and economic information. The average age of the fruit vendor was 39.04 ± 11.25 years. Of the 416 fruit vendors, 97.4% were males, and nearly 95% had schooling. Most of them were of the nuclear family (58.2%). The fruit vendor's average daily working hours was 11.05 ± 2.47 (3-16 hours). The average family members and earning members in the family of the fruit vendor were 5.38 ± 1.80 and $1.59 \pm .922$, respectively. Only 14.7% of them had income BDT. ≤ 15000 , whereas nearly 60% spent monthly for the family BDT. 15000. During the lockdown, 80% received financial support ([Table 1](#)).

3.2. Safety measures and sanitation

Safety measures and sanitation facilities are two critical aspects of health and hygiene related to COVID-19. Fruit vendors are to deal with different types of customers (both aware and unaware) all day. So, safety measures against Coronavirus infection are badly needed. However, they must stay at their shop from 8 to 11 hours, and sanitation facilities must be available. [Figure 1](#) describes the fruit vendors' safety measures and sanitation facilities.

Table 1. Percentage distribution of the fruit vendors by sociodemographic information

Variable		N (%)	M	SD
Age of the fruit vendor	Younger age	245 (58.9)		
	Older in age	171 (41.1)		
Sex	Female	11 (2.6)	39.04	11.25
	Male	405 (97.4)		
Schooling	No	22 (5.3)		
	Yes	394 (94.7)		
Place of residence	Rural	197 (47.4)		
	Urban	219 (52.6)		
Family type	Extended	174 (41.8)		
	Nuclear	242 (58.2)		
House types	Pucca (brick-built)	166 (39.9)		
	Semi-pucca	250 (60.1)		
Working hours per day	3-8 hour	68 (16.3)	11.05	2.47
	9-16 hour	348 (83.7)		
Family members	≤4	155 (37.3)	5.38	1.79
	>4	261 (62.7)		
Earning members in the family	1	229 (57)	1.59	.922
	≥2	187 (43)		
Family income (BDT)	≤15000	335 (85.3)		
	>15000	81 (14.7)	30508.42	47151.32
Family expenditure (BDT)	≤15000	171 (41.1)	22928.61	30167.70
	>15000	245 (58.9)		
Place of business	Rural	115 (27.6)		
	Urban	301 (72.4)		
Duration of business	≤15 years	331 (79.6)	10.20	7.86
	>15 years	85 (20.4)		
Receiving financial support	No	333 (80)		
	Yes	83 (20)		

M-mean, SD-standard deviation

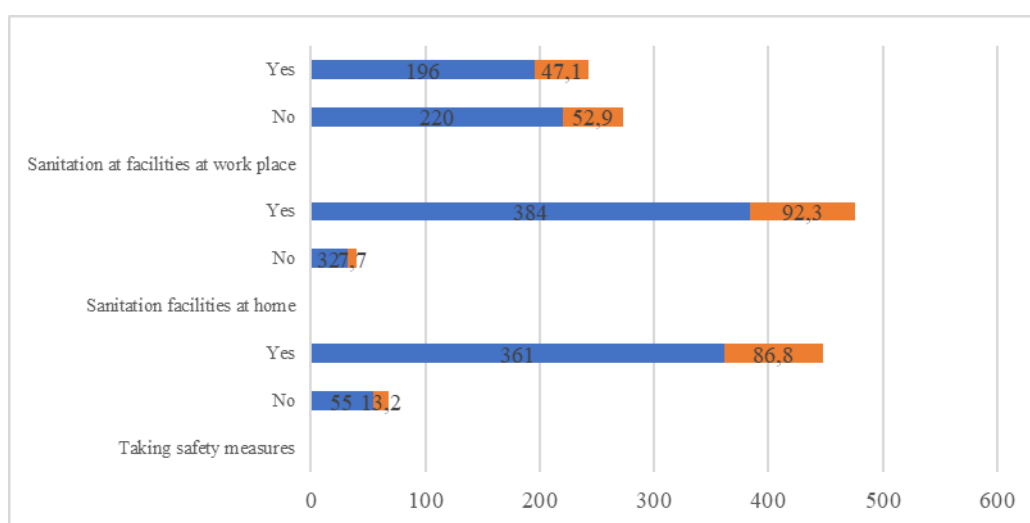


Figure 1. Percentage distribution of the fruit vendors by safety measures and sanitation facilities

Nearly 87% of the fruit vendors in this study took safety measures. Though more than 92% of them had sanitation facilities at home, 52.9% of them had no sanitation facilities at the workplace.

3.3. Safety measures and economic aspects

Safety measures are related to sociodemographic and economic aspects of the fruit seller. Table 2 illustrates the association of fruit vendors' safety measures and sanitation facilities with their socioeconomic aspects. A statistically significant association between fruit vendors' age ($p=.039$), sex ($p=.08$), schooling ($p<.001$), place of residence ($p<.001$), house types ($p=.001$), place of business ($p=.001$), receiving financial support ($p=.017$) and safety measures was found. In the case of sanitation facilities at home, sex ($p<.001$), schooling ($p<.001$), place of residence ($p<.001$), house types ($p<.001$), working hours ($p=.001$), family expenditure ($p=.019$) and receiving financial support ($p=.014$) were statistically associated. The same relations are found between house types ($p=.004$), family income ($p<.001$), duration of business ($p=.020$), and sanitation facilities at the workplace.

Table 2. Association of socioeconomic aspects with safety measures and sanitation facilities

Variables	Safety measures			Sanitation at home			Sanitation at workplace		
	No	Yes	<i>p</i>	No	Yes	<i>p</i>	No	Yes	<i>p</i>
Age									
Younger age	25(10.2)	220(89.8)	.039*	18(7.3)	227(92.7)	.852	133(54.3)	112(45.7)	.549
Older age	30(17.5)	141(82.5)		14(8.2)	157(91.8)		87(50.9)	84(49.1)	
Sex									
Female	5(45.5)	6(54.5)	.008*	6(54.5)	5(45.5)	.000**	9(81.8)	2(18.2)	.067
Male	50(12.3)	355(87.7)		26(6.4)	379(93.6)		212(52.1)	194(47.9)	
Schooling									
No	12(54.5)	10(45.5)	.000**	8(36.4)	14(63.6)	.000**	15 (68.2)	7(31.8)	.188
Yes	43(10.9)	351(89.1)		24(6.1)	370(93.9)		205(52)	189(48)	
Place of residence									
Rural	49(24.9)	148(75.1)	.000**	26(13.2)	171(68.8)	.000**	110(55.8)	87(44.2)	.280
Urban	6(2.7)	213(97.3)		6(2.7)	213(97.3)		110(50.2)	109(49.8)	
Family type									
Extended	25(14.4)	149(85.6)	.561	16(9.2)	158(90.8)	.355	89(51.1)	85(48.9)	.552
Nuclear	30(12.4)	212(87.6)		16(6.6)	226(93.4)		131(54.1)	111(45.9)	
House types									
Pucca	11(6.6)	155(93.4)	.001*	2(1.2)	164(98.8)	.000**	73(44)	93(56)	.004*
Semi-pucca	44(17.6)	206(82.4)		30(12)	220(88)		147(58.8)	103(41.2)	
Working hours									
3-8 hour	8(11.8)	60(88.2)	.845	13(19.1)	55(80.9)	.001*	39(57.4)	29(42.6)	.429
9-16 hour	47(13.5)	301(86.5)		19(5.5)	329(94.5)		181(52)	167(48)	
Family members									
≤4	24(15.5)	131(84.5)	.299	13(8.4)	142(91.6)	.344	86 (55.5)	69(44.5)	.419
>4	31(11.9)	230(88.1)		19(7.3)	242(92.7)		134(51.3)	127(48.7)	
Earning members									
1	32(14)	197(86)	.664	15(6.6)	214(93.4)	.359	122(53.3)	107(46.7)	.921

≥2	23(12.3)	164(87.7)		17(9.1)	170(90.9)		98(52.4)	89(47.6)	
Family income									
≤15000	50(14.1)	305(85.9)	.305	31(8.7)	324(91.3)	.066	204(57.5)	151(42.5)	.000*
>15000	5(8.2)	56(91.8)		1(1.6)	60(98.4)		16(26.2)	45(73.8)	
Family expenditure									
≤15000	22(12.9)	149(87.1)	.884	20(11.7)	151(88.3)	.014*	91(53.2)	80(46.8)	.921
>15000	33(135)	212(86.5)		12(4.9)	233(95.1)		129(52.7)	116(47.3)	
Place of business									
Rural	26(22.6)	89(77.4)	.001*	11(9.6)	104(90.4)	.412	58(50.4)	57(49.6)	.583
Urban	29(9.6)	272(90.4)		21(7)	280(93)		162(53.8)	139(46.2)	
Duration of business									
≤15 years	39(11.8)	292(88.2)	.105	27(8.2)	304(91.8)	.649	185(55.9)	146(44.1)	.020*
>15 years	16(18.8)	69(81.2)		5(5.9)	80(94.1)		35(41.2)	50(58.8)	
Receiving financial support									
No	37(11.1)	296(88.9)	.017*	20(6)	313(94)	.019*	174(52.3)	159(47.7)	.625
Yes	18(21.7)	65(78.3)		12(14.5)	71(85.5)		46(55.4)	37(44.6)	

* $p < 0.05$; ** $p < 0.001$

3.4. Safety measures

Safety measures merely depend on sociodemographic and economic aspects. Table 3 explains the predictors of fruit vendors' safety measures. Fruit vendors' schooling (OR=.200, 95% CI, .071-.559) and place of residence (OR=.094, 95% CI, .036-.250) negatively influenced safety measures. Though age (β =.285, OR=1.33), type of houses (β =.410, OR=1.50), place of business (β =.207, OR=1.23), and receiving financial support (β =.359, OR=1.43) was significant, they had a positive effect on safety measurement of the fruit vendors during COVID-19 in Bangladesh.

Table 3. Predictors of fruit vendors' safety measures with sociodemographic factors

Sociodemographic factors	β	S.E.	OR	95% CI for OR	
				Lower	Upper
Age	.285	.350	1.33	.670	2.63
Sex	-1.132	.777	.323	.070	1.48
Schooling	-1.612	.525	.200	.071	.559
Place of residence	-2.361	.497	.094	.036	.250
Type of houses	.410	.397	1.50	.692	3.27
Place of business	.207	.359	1.23	.608	2.48
Receiving financial support	.359	.361	1.43	.705	2.90

* $p < 0.05$; ** $p < 0.001$.

3.5. Sanitation at home

Sanitation at home is important in maintaining health and hygiene for the family. Table 4 explicates the predictors of fruit vendors' sanitation at home. Though fruit vendors' sex (OR=.215, 95% CI, .048-.960), schooling (OR=.151, 95% CI, .08-.478), and working hours (OR=.284, 95% CI, .114-.708) had a negative influence, types of houses (OR=5.42, 95% CI, 1.20-24.35) were significant and positive influential factors to have sanitation facilities at home during COVID-19 in Bangladesh. Amongst these factors, the type of house was 5.42 times more significant in the model.

Table 4. Predictors of fruit vendors’ sanitation at home with sociodemographic factors

Sociodemographic factors	β	S.E.	OR	95% CI for OR	
				Lower	Upper
Sex	-1.53	.764	.215	.048	.960
Schooling	-1.88	.587	.151	.048	.478
Place of residence	-.984	.511	.374	.137	1.018
Type of house	1.69	.767	5.42	1.20	24.35
Working hour	-1.25	.466	.284	.114	.708
Family expenditure	-.427	.466	.652	.262	1.624
Receiving financial support	.411	.459	1.50	.613	3.713

* $p < 0.05$; ** $p < 0.001$

3.6. Sanitation at home

Sanitation at the workplace is a complex issue for the fruit seller. There are many things related to sanitation in the workplace. Table 5 illuminates the predictors of fruit vendors' sanitation at the workplace. Though Fruit vendors’ type of houses (OR=1.65, 95% CI, 1.10-2.49) was a significant and positive influential factor, family income (OR=.278, 95% CI, .150-.515), and duration of business (OR=.593, 95% CI,.360-.977) had a negative influence on sanitation facilities at the workplace during COVID-19 in Bangladesh.

The type of house was 1.65 times more significant for the model to explain the influence of socioeconomic factors on sanitation facilities.

Table 5. Predictors of fruit vendors’ sanitation at the workplace with sociodemographic factors

Sociodemographic factors	β	S.E.	OR	95% CI for OR	
				Lower	Upper
Type of house	.506	.209	1.65	1.10	2.49
Family income	-1.279	.314	.278	.150	.515
Duration of business	-.523	.255	.593	.360	.977
Constant	1.199	.374	3.31		

* $p < 0.05$; ** $p < 0.001$

4. DISCUSSION

To be protected from coronavirus, it’s an urge to follow the health and hygiene rules for the fruit vendors and the customers during COVID-19. There is an equal chance of being infected if one becomes sluggish to take proper measures against the virus. Compared to the time spent by the two, fruit vendors spent 3-16 hours in their makeshift shops dealing with customers. They needed to use hand sanitizer and face masks after a while while dealing with customers and maintaining a safe social distance. The most common measures against COVID-19 were avoiding public areas, using hand hygiene, wearing masks, and distancing (MacIntyre et al., 2021; Xie et al., 2020). Fear of Coronavirus infection and government initiatives might have compelled them to do it. Lack of economic support and market management was considered to cause the unavailability of sanitation facilities at home and in the workplace.

Fruit vendors’ socioeconomic contexts were associated with safety measures. This is consistent with the study by Andersen et al. (2022) and Hadizadeh-Talasz et al. (2022). To them, increased age, sex, schooling, income, and race/ethnicity impacted the safety measures of their subjects. A study in Saudi Arabia showed that females showed, to some extent, better practice than males, but males showed more awareness of COVID-19 (Alahdal et al., 2020). Fruit vendors who were young, educated, lived in rural areas, dwelling in pucca houses, and receiving financial support were likely to follow the safety

measures during COVID-19. Safety measures depended on location, mandates, age, education, having symptoms, and knowing someone with COVID-19 and having negative experiences with it reduced the possibility of following safety measures (MacIntyre et al., 2021; Singh et al., 2016). School and place of residence negatively influenced fruit vendors' safety measures. According to Yanti et al. (2020) and Asnakew et al. (2020), respondents with sufficient knowledge and a good attitude toward COVID-19 positively complied with safety behaviors (Ferdous et al., 2020). Family support and resources were also influential factors in preventive behaviors against COVID-19 (Wong et al., 2020; Azizi et al., 2020).

Sanitation and hygiene are becoming harder in poor settings such as households, schools, and healthcare facilities in rural and urban slums (Kalpana et al., 2021). This study also found that fruit vendors' sex, schooling, residence, type of house, working hours, family expenditure, and financial support were allied with sanitation facilities at home, and these findings are similar to the study by Prakash et al. (2022). They found state and regional disparities, along with rural-urban gaps in the accessibility of sanitation facilities. Rajaraman et al. (2013) mentioned their study's lack of sanitation facilities. To them, access to sanitation varied by occupation and sex, and the underlying causes were shame and fear (for females), long distances, and insecurity in the surrounding areas.

In addition, house types, family income, and fruit vendors' business duration were linked with workplace sanitation facilities. Limited and unimproved facilities decreased significantly with increased economic status (Prakash et al., 2022; Kansime et al., 2021). Fruit vendors with male sex, schooling, and more working hours were likely to be negatively influenced regarding sanitation facilities. However, the type of houses positively stimulated them to have sanitation facilities at home during COVID-19 in Bangladesh. The household head and socioeconomic factors significantly affect access to improved sources of toilet facilities, which varies from one residence community to another (Agbadi et al., 2019). This study further added that the type of houses had the most significant impact on sanitation facilities at the workplace. Fruit vendors with more family income and business duration were negatively influenced to have sanitation facilities at the workplace during COVID-19 in Bangladesh. Agbadi et al. (2019) mention that female-headed households, family heads with at least middle-school-level education, married, rural households, households with a minimum of seven members, and households with at least middle-wealth status had higher access to improved sanitation facilities.

5. STRENGTHS AND LIMITATIONS OF THE STUDY

The most important thing about this study was that data were collected from three urban areas of the country. There was a diversity among the respondents. It was conducted during the COVID-19 pandemic with face-to-face interviews. It was an opportunity to follow the expression of the fruit vendors while seeking information regarding safety measures and sanitation. The study has some limitations also. The sample size was relatively small. A larger sample would produce a better result on this issue. Students of the Sociology Discipline at Khulna University collected data from the field. They needed proper training and a professional demeanor. Many more relevant matters should be added to unveil the health and hygiene factors of the fruit vendors. Finally, it was a quantitative study. Mixed method approaches would help to understand safety measures more in-depth if their background stories were linked to this study.

6. IMPLICATION OF THE STUDY

State authorities should compel fruit vendors to follow the health and hygiene rules in customer dealings. There should be sanitation management near the fruit shop. Special rules can be passed for them during the pandemic because people getting doctors' prescriptions want to buy fruits from them to be cured of diseases. Going outside during the lockdown period is only sometimes possible, and many people prefer to purchase fruits from them. Social campaigns can make them more conscious of safety measures

during COVID-19. A subsidy system can be started from the state-end to run their business.

7. CONCLUSION

Though a large portion of the fruit vendors followed safety measures during COVID-19, a small number of them can only improve the situation if they abide by the health and hygiene against Coronavirus specifically in customer dealings. Sanitation facilities at home and workplace are equally crucial for fruit vendors. Because virus contamination occurs through unhygienic and unhealthy measures. As the socioeconomic backgrounds of the fruit vendors were related to safety measures and sanitation facilities, their conditions should be improved by taking different initiatives. Their daily income during the lockdown period becomes uncontained (as most of the fruit vendors' monthly income was less than 15000 BDT). From that corner, subsidies to promote their economic conditions can be considered. Social campaigns raising awareness of the need to be protected from coronavirus can be fruitful in such a situation.

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Institutional Review Board Statement: This study was approved by the Institutional Review Board (IRB) of Khulna University, and the protocols used in the study were approved by the Committee of Human Subjects Protection of Khulna University Research Cell, Khulna, Khulna-9208, Bangladesh.

Informed Consent Statement: Fruit vendors' consent was taken before data collection. We also confirmed that these data will be used for research purposes.

Data Availability Statement: Data will be made available on request.

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

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