

An Analysis of the Changes in Livelihood, Income Structure, and Food Security during COVID-19 among Female Household Workers in Rajshahi

Nazia Hossain

Department of Urban & Regional Planning, Rajshahi University of Engineering & Technology (RUET), Rajshahi, Bangladesh
Email: naziaurp@urp.ruet.ac.bd

How to cite this paper: Hossain, N. (2026) An Analysis of the Changes in Livelihood, Income Structure, and Food Security during COVID-19 among Female Household Workers in Rajshahi. *Food and Nutrition Sciences*, 17, 797-813.
<https://doi.org/10.4236/fns.2026.179051>

Received: August 6, 2026

Accepted: September 17, 2026

Published: September 20, 2026

Copyright © 2026 by author(s) and Scientific Research Publishing Inc.
This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).
<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

The outbreak of COVID-19 posed a serious threat to the lives of low-income people as it snatched their livelihood, income, and food security. Female household workers are a low-income group in Bangladesh. Most of them lost their jobs for fear of being affected. Similar conditions were also seen in Rajshahi, one of the divisional cities in Bangladesh. During the pandemic, educational institutions were closed. Many female household workers working in hostels and houses lost their jobs. This study aims to identify changes in their livelihood, income, and food security status during COVID-19, compared with the period before COVID-19. To this end, the study selected 30 female household workers from five selected hostels and explored the relationship between their income patterns and their households' food security status before and during COVID-19. A questionnaire survey was conducted to capture changes in food patterns, livelihoods, and income structure. Furthermore, coping mechanisms to address the crisis during the pandemic were identified and prioritized through rank scoring. Food Consumption Score (FCS) and Household Dietary Diversity Score (HDDS) were calculated to explore food consumption and dietary patterns of their households. In this study, these two scores were applied as indicators of food security. Moreover, income and livelihood were linked to the food security pattern. The results show that the income of household workers was significantly reduced during COVID-19. Their food collection from the workplace was also interrupted, which increased the burden on their limited income. As a result, the FCS and HDDS revealed constant consumption and less diversity during the pandemic.

Keywords

COVID-19, Food Security, Female Household Workers, Food Consumption Score (FCS), Household Dietary Diversity Score (DDS), Coping Strategies

1. Introduction

Food, the first need for human beings to survive, must be secured with proper intake. Considering the primacy of food, the term “Food Security” has evolved after the post-World War I period between 1930 and 1945 [1] [2]. The initial focus was on the food supply, availability, and stability of local and global prices [3] [4]. The World Food Conference, 1974, defined food security in terms of food availability, adequacy, consumption, and production [3]. Gradually, the definition of food security included physical and economic accessibility [3]. In the World Food Summit, 1996, food security was defined as:

...“when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.

The report of the Food and Agriculture Organization (FAO) on “The State of Food Insecurity in the World 2001” states a refined concept of food security that encompasses:

...“a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” [3] [5] [6].

Most importantly, the Sustainable Development Goals (SDGs) (2015-2030) declared food security as the term “Zero Hunger” in goal 2 [7]. This document ensures food security as a part of urban development.

COVID-19, the pandemic initiated on 31st December 2019, firstly in Wuhan, China, was declared a pandemic [8]. This affected all the sectors of urban development: social, political, and financial, and also food security [9]-[12]. Due to the fear of spreading the virus, low-income people were fired from their workplace, and their income was cut off. This subsequently reduced food purchasing power and affected food security [13].

A large segment of these lower-income people in our country are female household workers. Most of the time, these workers come from rural areas in the hope of a better life. The need for domestic workers for families with both male and female jobholders is inevitable. However, the pandemic changed the scenario, took their work, and forced them to lead a miserable life. According to a study by Oxfam Canada, it is seen that about 10.5 million people are acting as domestic workers in Bangladesh [14]. Among them, 90% are female [15]. Around 30 lakh domestic workers of the country have lost their income due to the Covid-19 pan-

demic and have been living an inhuman existence and starving with their families [16].

.... “around 57 percent of the domestic workers have lost their jobs”. “Salma, a young domestic worker in Bangladesh, used to work in five houses and earn 7,000 BDT per month to manage her family. Because of the pandemic, she got fired from two houses and her income dropped to 3,000 BDT per month, less than half of what she used to earn” [15]. This scenario was common in the country during the lockdown due to COVID-19.

Rajshahi, one of the oldest divisional cities in Bangladesh, also suffered a lot from COVID-19. It was considered a high-priority region for immediate vaccination (**Figure 1**) [17]. Likewise, in the capital and other cities of Bangladesh, the low-income people were also in trouble. Rajshahi is called “Shikkhanogory” in Bangla, meaning the city of education. Several renowned universities are there: Rajshahi University of Engineering & Technology (RUET), Rajshahi University (RU), Rajshahi Medical College (RMC), and others. As a result, a significant number of students’ hostels are seen in this city. A large share of the household income of the female workers comes from there. The female household workers of Rajshahi get enough food from their workplace three times a day for themselves. However, during the lockdown, their income and related facilities were not available.

COVID-19 came as a curse to the lives of lower-income people. In research, it has explored that in low-income households of Narayanganj, there was the existence of HH food insecurity at the time of the lockdown, and the loss of livelihood was the reason behind this [16]. During the COVID-19 lockdown, approximately 92% of urban households in Bangladesh experienced some degree of food insecurity. Nearly 71% adopted both financial and food compromise coping strategies. This included borrowing money or food and reducing or modifying food consumption, and so on [18]. Loss of income of these lower-income people due to the lockdown hampered proper food consumption both in quality and quantity because of unaffordability and inaccessibility to the market [19]. A study of the lower-income group in Dhaka city revealed that the pandemic severely affected livelihoods and food security. Reduced income affected food purchasing power, and people had to consume insufficient food. The findings revealed that approximately 80% of respondents experienced a reduction in income. Also, about one-quarter lost their jobs between March and June 2020 [20].

Several studies have been conducted to explore the living, income, and food security conditions of low-income groups in the context of COVID-19. However, no research has been conducted yet on the condition of domestic workers during COVID-19. Some research has been conducted by OXFAM, the Institute of Development Studies, etc., to show the misery of the female household workers in Dhaka city. However, in Rajshahi city, where working opportunities for female household workers are plentiful, no study has been conducted yet. With these considerations, this study appraised the changes in food, livelihood, and income during COVID-19. The study identified several coping strategies adopted by

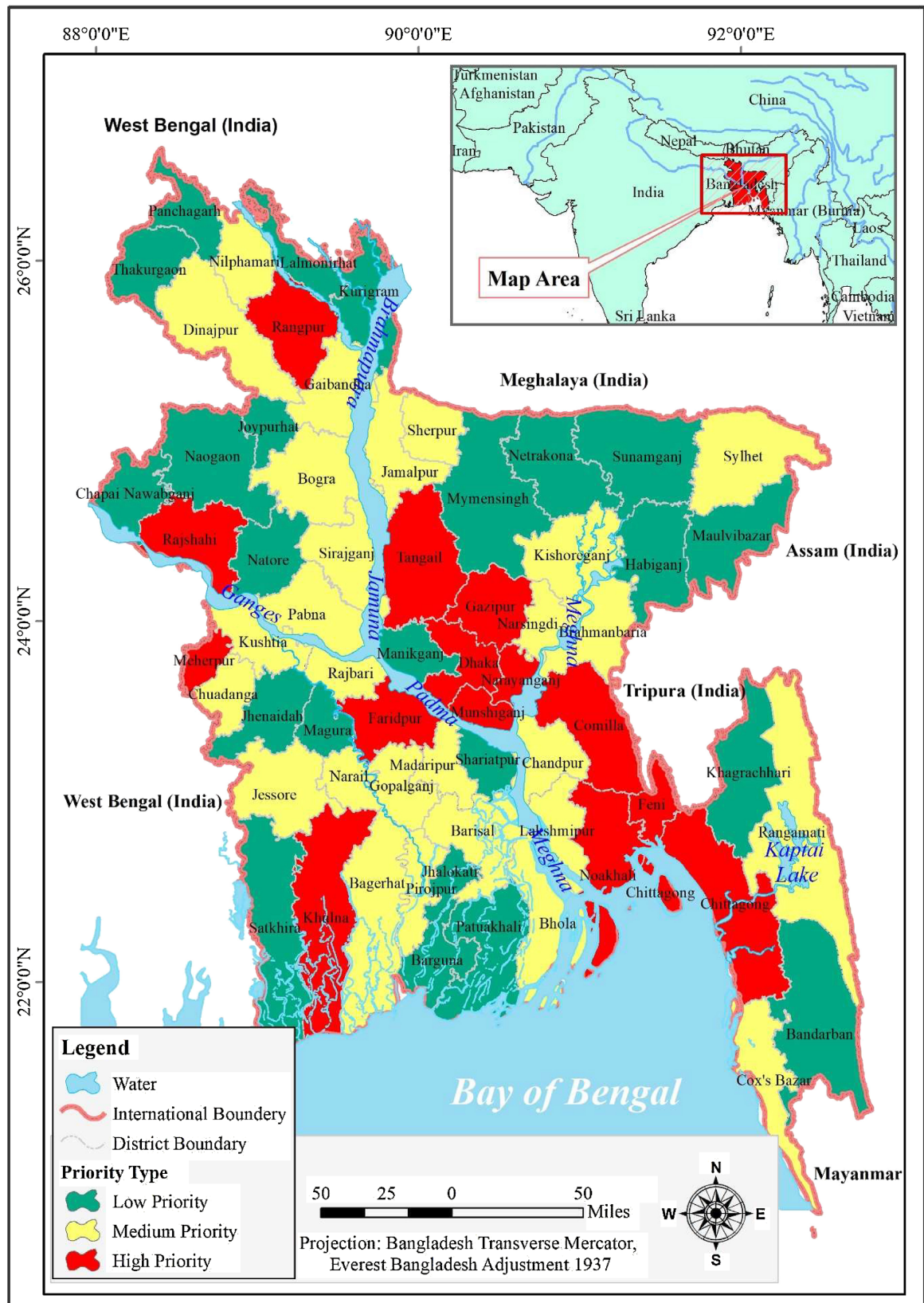


Figure 1. Map showing the prioritized vaccination zones of COVID-19 in Bangladesh (Circle is pointing to Rajshahi) (Source: [17]).

household workers to address these changes and uphold the food security of their households.

2. Materials and Methods

2.1. Study Area and Target Population Selection

To conduct the study, five students' hostels, as shown in **Figure 2**, were selected as the study areas. Female household workers are the target group for this study. In Rajshahi city, their workplaces are divided into three categories: houses, student hostels, and both.

A preliminary survey was conducted to identify the HH workers. This study was conducted in 2022, after the COVID-19 pandemic. Students' hostels were selected because the HH workers working in hostels also work in houses. Several HH workers who were working in hostels at the time of this study were employed in houses before the COVID-19 pandemic. This study tried to present the conditions of the target group in all workplaces before and during the COVID-19 pandemic period.

A total of 30 female workers were found in the hostels and selected as the sample to carry out the study.

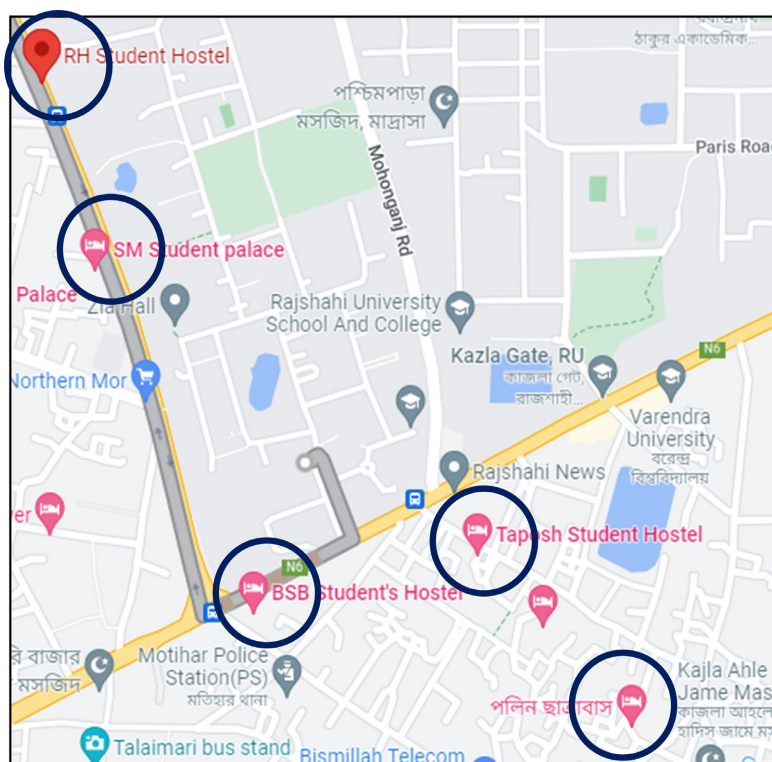


Figure 2. Map of the study area (circles show the study areas).

2.2. Data Requirements and Collection Process

A questionnaire survey was conducted to collect data on demographic characteristics, the workplace of household workers, changes in income level, income

source, and workplace during COVID-19, and so on. These data denote the livelihood and income structure of the target group.

Furthermore, data on the food intake structure of the workers' households were collected. Data on food consumption and dietary intake of the households of the workers' families were collected. Also, food collection processes by the workers to manage their households were identified.

Finally, the coping strategies to address the impact of COVID-19 on food security were identified.

2.3. Data Processing and Analysis

Data collected from the questionnaire survey were analyzed using Microsoft Excel. Basic demographic data, livelihood status, and income data have been analyzed and represented in bar charts, pie charts, and tabular format.

Food patterns were analyzed using the Food Consumption Score (FCS) and the Household Dietary Diversity Score (HDDS).

Data on food consumption and food diversity have been calculated following the food charts and equations below:

Table 1. Food chart for calculating FCS.

SI	Food items	Food Groups (definitive)	Weight (definitive)
1	Maize, maize porridge, rice, sorghum, millet pasta, bread, and other cereals	Main staples	2
	Cassava, potatoes, sweet potatoes, other tubers, plantains		
2	Beans, peas, ground nuts, and cashew nuts	Pulses	3
3	Vegetables, leaves	Vegetables	1
4	Fruits	Fruit	1
5	Beef, goat, poultry, pork, eggs, and fish	Meat and fish	4
6	Milk yogurt and other dairy	Milk	4
7	Sugar and sugar products, honey	Sugar	0.5
8	Oil, fats, and butter	Oil	0.5

Source: [21].

Following this chart and considering the weight of each food group, the equation below is applied to calculate FCS.

$$FCS = a_{staple}x_{staple} + a_{pulse}x_{pulse} + a_{veg}x_{veg} + a_{fruit}x_{fruit} + a_{animal}x_{animal} + a_{sugar}x_{sugar} + a_{dairy}x_{dairy} + a_{oil}x_{oil}$$

where,

x_i = Frequencies of food consumption = number of days for which each

a_i = Weight of each food group

*Food group was consumed during the past 7 days (7 days were designated as

the maximum value of the sum of the frequencies of the different food items belonging to the same food group)

FCS is assessed by considering the following ranges:

Poor consumption = 0 - 21

Borderline consumption = 21.5 - 35

Acceptable consumption ≥ 35

After that, the Dietary diversity of the household has been obtained through calculating the Household Dietary Diversity Score (HDDS) with the following food chart:

Table 2. Food chart for calculating HDDS.

Food group	Examples	Yes = 1 No = 0
Cereals	Corn/maize, rice, wheat, sorghum, millet, or any other grains made from these (e.g., bread, noodles, porridge, or other grain products) + insert local foods, e.g.	
White roots and tubers	White potatoes, white yams, white cassava, or other foods made from roots	
Vitamin A-rich vegetable	Pumpkin, carrot, squash, or sweet potato that are orange inside, and other locally available vitamin A-rich vegetables (e.g., red sweet pepper)	
Dark green leafy vegetables	Dark green leafy vegetables, including wild forms and locally available vitamin A-rich leaves such as amaranth, cassava leaves, kale, spinach.	
Other vegetables	Other vegetables (e.g., tomato, onion, eggplant) + other locally available vegetables	
Vitamin A-rich fruits	Ripe mango, cantaloupe, apricot (fresh or dried), ripe papaya, dried peach, and 100% fruit juice made from these, and other locally available vitamin A-rich fruits.	
Other fruits	Other fruits, including wild fruits and 100% fruit juice made from these	
Organ Meat	Liver, kidney, heart, or other organ meats or blood-based foods	
Fresh meats	Beef, pork, lamb, goat, rabbit, game, chicken, duck, other birds, insects	
Eggs	Eggs from chicken, duck, guinea fowl, or any other egg	
Fish and seafood	Fresh or dried fish or shellfish	
Legumes, nuts, and seeds	Dried beans, dried peas, lentils, nuts, seeds, or foods made from these (e.g., hummus, peanut butter)	
Milk and milk products	Milk, cheese, yogurt, or other milk products	
Oils and fats	Oil, fats, or butter added to food or used for cooking.	
Sweets	Sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies, and cakes	
Spices, condiments, and beverages	Spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, and alcoholic beverages	

Source: [22].

*Food group was consumed during the last 24 hours is the consideration and the information was collected through questionnaire.

The following procedure is followed for calculating HDDS:

1. Regrouping the 16 food groups used for FCS into the 7 food groups.
2. For each food group, a new binomial variable that has two possible values.
 - 1 - yes: the household/individual consumed that specific food group.
 - 0 - no: they did not consume that food.
3. Sum all the binomial variables to create an HDDS.

The threshold values for HDDS are:

- 6+: high = good dietary diversity
- 4.5 - 6: medium dietary diversity
- <4.5: low dietary diversity

Besides, food sources have been presented showing the percentage in a pie diagram. The link between the income of household workers and the FCS and HDDS has been established both for the COVID-19 pandemic and before that.

Food costs for each household were calculated after the preparation of a food chart for seven days a week. The information on coping strategies adopted by female workers during the pandemic was collected from a questionnaire and prioritized through a rank scoring method. The strategy with the highest score was ranked 1 and considered a top priority. Likewise, other coping strategies were ranked and prioritized. The result was shown in a stacked column.

3. Results and Discussions

3.1. Basic Demographic Characteristics of the Female Household Workers

The study shows that the age group of most (45%) of the female household workers is in the 30 - 40 category (**Figure 3**). The study found that nearly 50% of the household workers' education level was Class 1 to 5 (**Figure 4**).

3.2. Analysis of the Income and Livelihood Patterns of the Female Household Workers

In the study, the livelihood patterns of female household workers in the selected study areas have been analyzed from two perspectives: workplace and income. In the study areas, it is found that before the COVID pandemic, 48% of workers

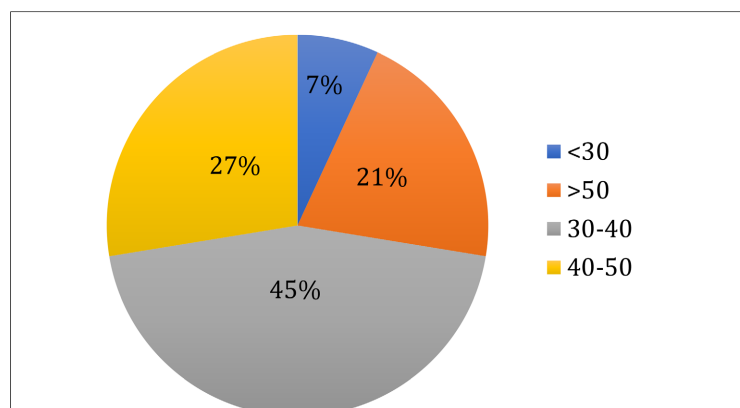


Figure 3. Age distribution of the selected female household workers.

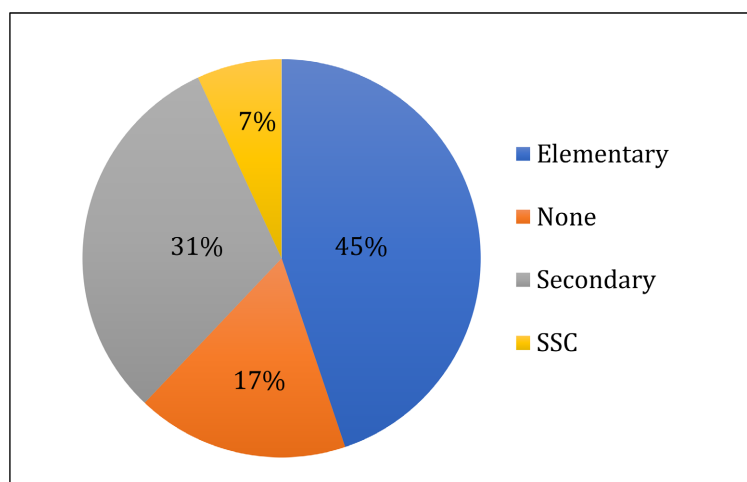


Figure 4. Level of education of the selected female household workers.

worked in houses. The number of workers working in hostels is relatively low. Besides, the percentage working in both places was 31%, not negligible.

Analysis of the workplace of workers revealed different categories during the COVID-19 pandemic, particularly during the lockdown period. The categories include having no job or being fired from work; occasionally working in houses or hostels; occasionally working in both places; regularly working in any of the places; and working in the same places before the COVID-19 period. **Table 3** shows that a maximum (28%) of workers worked either in houses or hostels occasionally, in case of any religious occasion, wedding ceremony, or party, etc. Additionally, a similar percentage (27%) of workers were fired from their jobs due to concerns about the safety of their households.

Table 3. Working places of the female HH workers before and during COVID-19.

Working place before COVID-19	% of involvement	Working place COVID-19 period	% of involvement
Houses	48%	No work/fired from work	27%
Hostels	21%	Occasionally house or hostels	28%
		Occasionally house and hostels both	10%
Both	31%	Regular work (Houses or hostels)	14%
		Same as before the COVID-19 period	21%

In this study, the income categories of female household workers have been categorized as follows: BDT less than 5000, BDT 5000 to 8000, BDT 8000 to 11,000. Before the pandemic, the average monthly income of a household worker was BDT 5000 to 8000 (52%). Also, the BDT 8001 - 11,000 category was visible enough (38%).

However, the scenario changed during the COVID-19 lockdown. Around 45% of the workers had no income, and 35% had an income of less than BDT 5000,

whereas before COVID-19, the percentage was only 10% (**Table 4**).

Table 4. Percentage of monthly income of the female household workers of the study area during and before the COVID-19 periods.

Income range	Before COVID-19 period	COVID-19 period
<5000	10%	35%
5000 - 8000	52%	10%
8001 - 11,000	38%	10%
No income	-	45%

3.3. Analysis of FCS and DDS and the Relationship with Income

One of the concerns of this study is to observe the food pattern during COVID-19, and a comparison with the period before COVID-19 of the households of the female workers. Food Consumption Score (FCS) denotes the food consumption pattern of the households. It provides the intake of food within the last seven days. From the study, it is identified that the food consumption pattern of the households is not poor (range 0 - 21), both pre and during COVID-19 conditions. At the pre-stage, the level was at the borderline (range: 21 - 35), and in most cases it is acceptable (range: >35). When it comes to observing the food consumption condition during COVID-19, the scenario says that the proportion of acceptance level in the case of food consumption was less than before the pandemic (**Figure 5**).

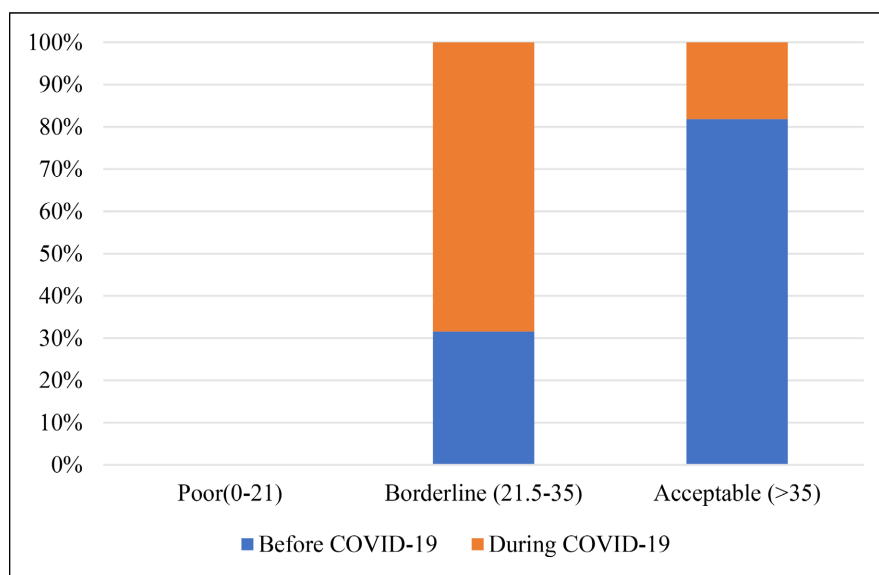


Figure 5. Variation in Food Consumption Score (FCS) before and during the COVID-19 period.

On the other hand, the diet of the households was not diversified (**Figure 6**). Both pre and during COVID-19 periods, the households did not consume diversified food. Thus, the level “Good diversity (>6)” is blank in **Figure 6**. In the

COVID-19 pandemic, the household's food diversification score is very poor (range <4.5). Whereas before COVID-19, they had a medium (4.5 - 6) level of food diversity.

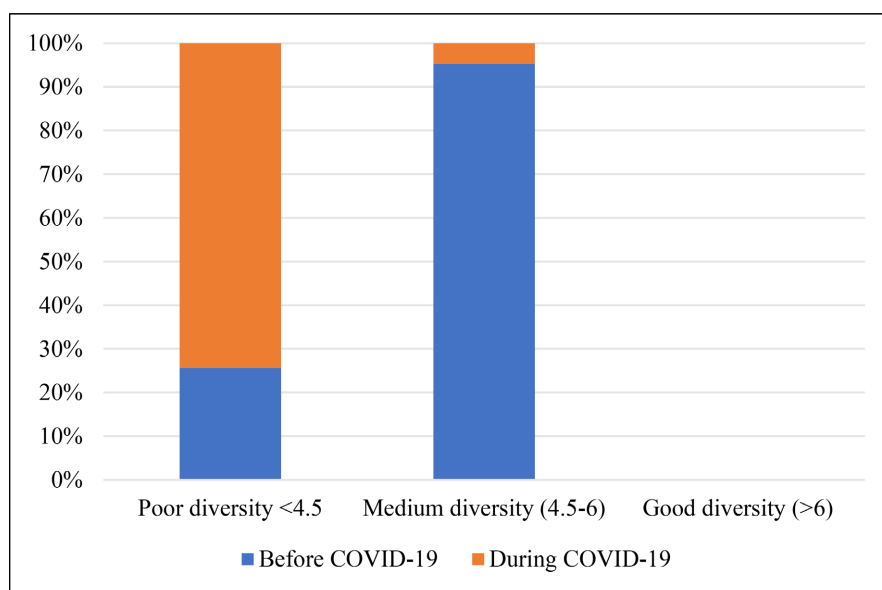


Figure 6. Variation in household dietary diversity score (HDDS) before and during COVID-19.

From the field survey, a generic food chart for one person of the family for a week was generated (Table 5). They mainly consume rice or carbohydrates. Alternatively, pulses and vegetables are present almost every day. Here, rice or potato or bread is considered the main staple. Sometimes, or very few times, they intake fruits or milk. Also, eggs and green vegetables were included in the food list during COVID-19. They do not starve, but the variation is below standard.

Table 5. A generic food chart of a household.

Days of weeks	Breakfast	Lunch	Dinner
Sat	Potato & rice	Rice & vegetable	Rice & pulse/vegetable
Sun	Rice, onion, chili	Rice & /fish	Rice & pulse/vegetables
Mon	Potato & rice	Rice & pulses/egg	Rice & Vegetables/fish
Wed	Potato & rice	Rice & egg	Rice& pulse/vegetables
Thurs	Potato & rice	Rice & egg	Rice & pulse/fish
Fri	Rice, onion, Chili, Egg	Rice & vegetables/ pulses/meat	Rice & pulse/vegetables

According to this food intake pattern, the average per day per person minimum food cost is approximately BDT 80 - 100. The family structure of an HH worker is shown in Figure 7. Most families have 4 to 5 members. Considering the per-day cost of food for an adult person, the monthly cost for each household is a mini-

mum of BDT 160 to 500. Total food cost per month was approximately BDT 13,000 - 15,000.

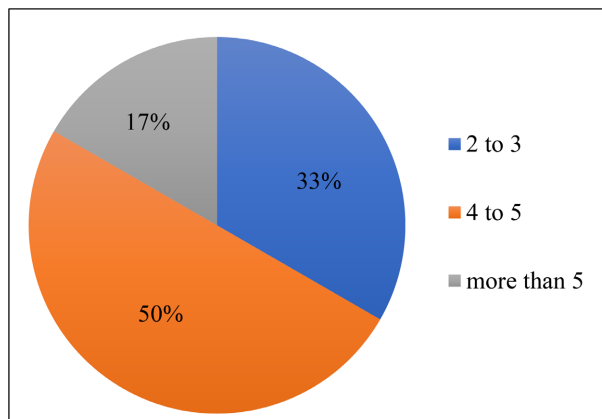


Figure 7. Percentage of family members of the female household workers.

Sometimes, the items vary due to special occasions. Most of the HH workers have other earning members in their family (**Figure 8**). In this case, with this financial support, food costs were bearable before the COVID-19 period. However, during the pandemic, bearing the high food costs was troublesome for the workers. Another important issue here is the sources of food during the two periods. Most of the time, female household workers avail food from their workplace (house/hostels/both). Also, they buy food from the market. Nearly 50% of female workers get food from both their workplace and the market (**Table 6**). The food they get from their workplace is enough for three meals a day. It is also worth mentioning that, in most cases, female workers work more than one place in a day.

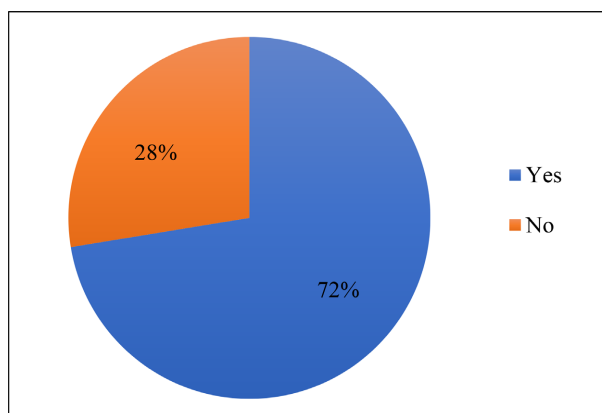


Figure 8. Presence of other earning family members.

During the COVID-19 pandemic, they had to spend money on buying food from the market (45%) (**Table 6**). Very few female workers were still in their jobs during the pandemic and got three times the food. Non-Government Organizations (NGOs) such as Quantum Foundation, BRAC, JAGORONI Foundation, etc., provided aid in some areas. Initiatives from the Trading Corporation of

Bangladesh (TCB) were undertaken to distribute food at a cheap rate. However, due to mismanagement, the support did not reach the poor.

Table 6. Food collection source before and during COVID-19.

Time	Sources of food collection			
	From market	From workplace	Both market and workplace	From government/NGOs or others
Before COVID-19 period	14%	38%	48%	-
COVID-19	45%	3%	35%	17%

Figure 9 and **Figure 10** illustrate the changes in food consumption and diversification patterns in response to income variation during both pre- and during COVID-19 periods. During the lockdown, food consumption was at the borderline as the income was less than 5000 BDT. Across all income ranges, COVID-19 led to lower food consumption in households than before COVID-19 periods (**Figure 9**). In the case of dietary diversity, the pattern is also not good within a similar income range (below BDT 5000) (**Figure 10**). An interesting observation from this analysis is that at an income level less than BDT 5000, the FCS is acceptable before COVID-19 period, but the HDDS is poor at the same time.

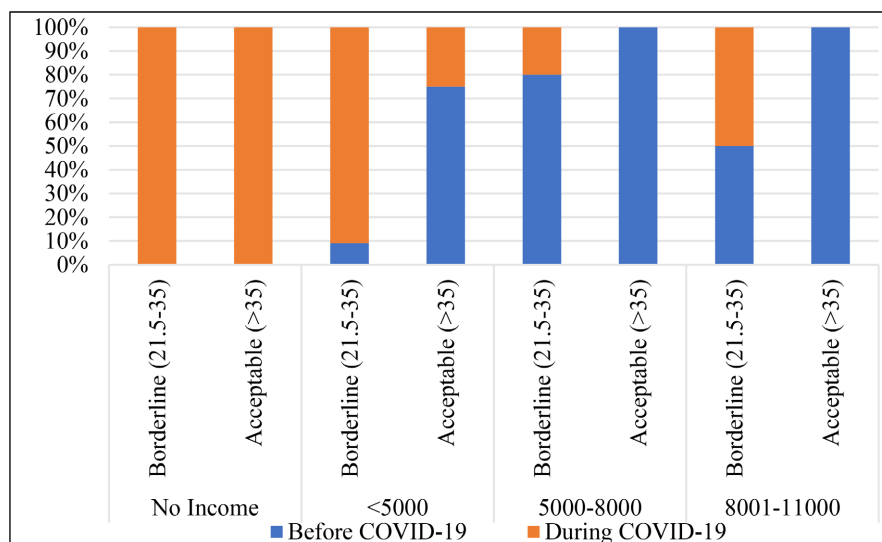


Figure 9. Income-wise FCS variation before and during the COVID-19 periods.

3.4. Coping Strategies of the Female Household Workers during COVID-19

Different strategies include cutting a meal one day; spending the income to feed all the other members of the family three times a day and consuming less on one's own; prioritizing the male and kids; ensuring one's own meal first; starving and providing the available food to all the members, and well distribution of food after managing from different sources.

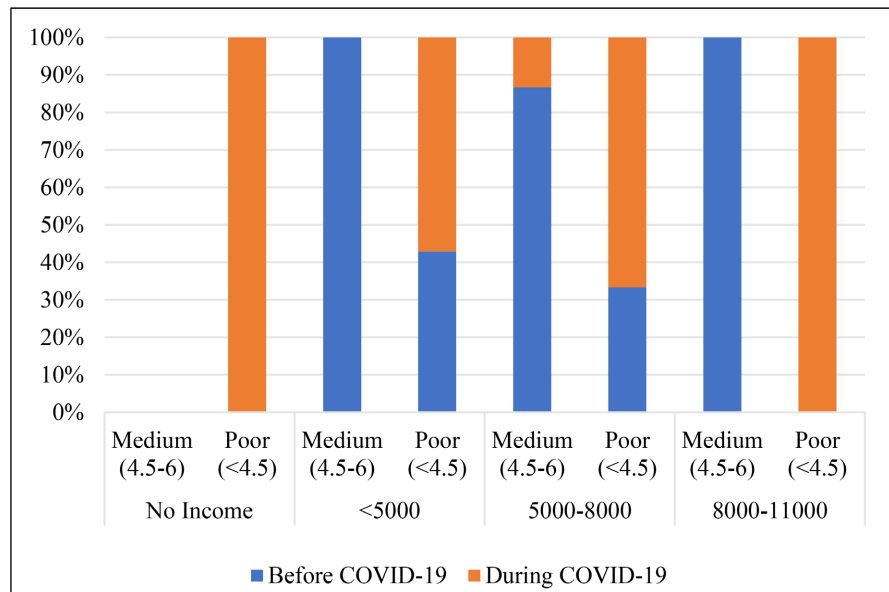


Figure 10. Income-wise HDDS variation before and during the COVID-19 period.

According to the workers, the distribution of food among all the members should be as much as possible. The second strategy they put in place is to spend their income to ensure food three times a day. After that, they focused on providing the food to the kids first. Some of the workers have small children. The female workers then fixed their target to feed the children first. Chronologically, the other strategies include continuing to starve and distributing available food to others. Occasionally, they prioritize male members: husbands, sons, brothers, and others. Lastly, they emphasized cutting out meals for the day. **Figure 11** shows the prioritization of different coping mechanisms.

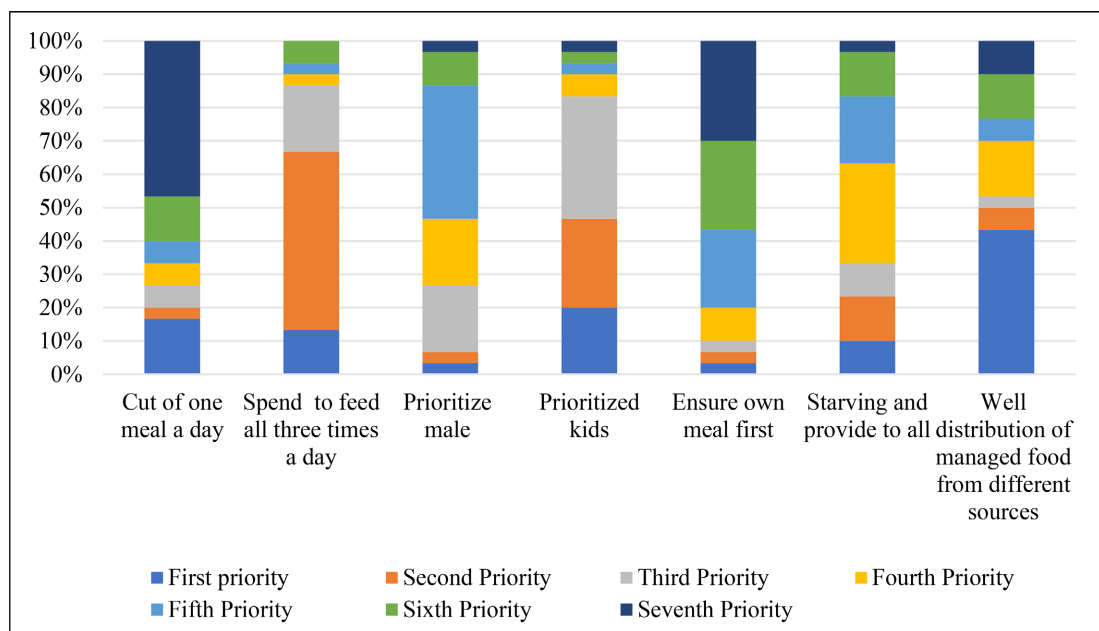


Figure 11. Prioritization of the coping strategies during COVID-19 to manage food security.

4. Conclusion

Female household workers are part of daily life in this working and busy society. COVID-19 brought them a painful life. Several families and students of the hostels of Rajshahi city need female household workers for household chores. Before COVID-19, life was not so difficult for them, as income was enough for survival. However, COVID-19 changed the scenario. Most of the workers were fired from their jobs. They suffered from managing necessities. Losing work, their income was cut in half compared to regular conditions. Before the pandemic, they had a fixed workplace as well as a consistent income. Their necessities were fulfilled according to their needs through their income and the support from their workplace. Unfortunately, a sudden decrease in income and a food shortage were beyond their thought. However, the pandemic led them to a pathetic experience.

Author Contributions

The author contributed to the initiation and study design, sample selection, and data collection. Furthermore, data analysis, interpretation, and completion with realistic findings were the most important parts. After acceptance, the author incorporated revisions based on the reviewers' comments.

Acknowledgement

The author highly appreciates the participants for their willing cooperation in the field survey.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

- [1] Simon, G.-A. (2012) Food Security: Definition, Four Dimensions and History. Food and Agriculture Organization.
- [2] Behera, B.K., Rout, P.K. and Behera, S. (2019) Move towards Zero Hunger. In: Behera, B.K., *et al.*, Eds., *Move towards Zero Hunger*, Springer, 1-35. https://doi.org/10.1007/978-981-32-9800-2_1
- [3] Berry, E.M., Dernini, S., Burlingame, B., Meybeck, A. and Conforti, P. (2015) Food Security and Sustainability: Can One Exist without the Other? *Public Health Nutrition*, **18**, 2293-2302. <https://doi.org/10.1017/s136898001500021x>
- [4] Engler-Stringer, R., Le, H., Gerrard, A. and Muhajarine, N. (2014) The Community and Consumer Food Environment and Children's Diet: A Systematic Review. *BMC Public Health*, **14**, Article No. 522. <https://doi.org/10.1186/1471-2458-14-522>
- [5] Food and Agriculture Organization (FAO) (2022) Chapter 2. Food Security: Concepts and Measurement. <https://www.fao.org/4/y4671e/y4671e06.htm>
- [6] Leroy, J.L., Ruel, M., Frongillo, E.A., Harris, J. and Ballard, T.J. (2015) Measuring the Food Access Dimension of Food Security: A Critical Review and Mapping of Indicators. *Food and Nutrition Bulletin*, **36**, 167-195. <https://doi.org/10.1177/0379572115587274>

- [7] United Nations Development Program (UNDP) (2022) Seoul Policy Centre for Knowledge Exchange through SDG Partnerships. https://www.undp.org/seoul-policy-centre/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CEN-TRAL&c_src=CENTRAL&c_src2=GSR&gclid=CjwKCAjw3qGYBhBSEi-wAcnTRLu1EC0ooX7cGVcPeNmpaR9MhHASE72LRG
- [8] World Health Organization (WHO) (2022) Emergencies: Coronavirus Disease (COVID-19) Update. [https://who.int/bangladesh/emergencies/coronavirus-disease-\(covid-19\)-update#:~:text=On%20this%20web-site%20you%20can,China%2C%20on%2031%20December%202019](https://who.int/bangladesh/emergencies/coronavirus-disease-(covid-19)-update#:~:text=On%20this%20web-site%20you%20can,China%2C%20on%2031%20December%202019)
- [9] Seddighi, H. (2020) COVID-19 as a Natural Disaster: Focusing on Exposure and Vulnerability for Response. *Disaster Medicine and Public Health Preparedness*, **14**, e42-e43. <https://doi.org/10.1017/dmp.2020.279>
- [10] Molina-Torres, R., Nolasco-Jáuregui, O., Rodriguez-Torres, E.E., Itzá-Ortiz, B.A. and Quezada-Téllez, L.A. (2021) A Comparative Analysis of Urban Development, Economic Level, and COVID-19 Cases in Mexico City. *Journal of Urban Management*, **10**, 265-274. <https://doi.org/10.1016/j.jum.2021.06.007>
- [11] Crush, J.S. and Frayne, G.B. (2011) Urban Food Insecurity and the New International Food Security Agenda. *Development Southern Africa*, **28**, 527-544. <https://doi.org/10.1080/0376835x.2011.605571>
- [12] Devereux, S., Béné, C. and Hoddinott, J. (2020) Conceptualising Covid-19's Impacts on Household Food Security. *Food Security*, **12**, 769-772. <https://doi.org/10.1007/s12571-020-01085-0>
- [13] Béné, C. (2020) Resilience of Local Food Systems and Links to Food Security—A Review of Some Important Concepts in the Context of COVID-19 and Other Shocks. *Food Security*, **12**, 805-822. <https://doi.org/10.1007/s12571-020-01076-1>
- [14] Polen, S. (2020) “There Is No Focus on Domestic Workers”: The Invisible Workforce in Bangladesh during COVID-19. <https://www.oxfam.ca/story/there-is-no-focus-on-domestic-workers-the-invisible-and-replaceable-workforce-in-bangladesh-during-covid-19/>
- [15] Latika, K.Z.A., Barua, J., Manzur, M.M., Shrabaoan, A.K. and Islam, M.T. (2021) Young Domestic Workers in Bangladesh Face the Economic Fallout from COVID-19. <https://www.ids.ac.uk/opinions/young-domestic-workers-in-bangladesh-face-the-economic-fallout-from-covid-19/>
- [16] Rezaul Karim, K.M. and Tasnim, T. (2022) Impact of Lockdown Due to COVID-19 on Nutrition and Food Security of the Selected Low-Income Households in Bangladesh. *Heliyon*, **8**, e09368. <https://doi.org/10.1016/j.heliyon.2022.e09368>
- [17] Sarkar, S.K. and Morshed, M.M. (2021) Spatial Priority for COVID-19 Vaccine Rollout against Limited Supply. *Heliyon*, **7**, e08419. <https://doi.org/10.1016/j.heliyon.2021.e08419>
- [18] Das, S., Rasul, M.G., Hossain, M.S., Khan, A., Alam, M.A., Ahmed, T., *et al.* (2020) Acute Food Insecurity and Short-Term Coping Strategies of Urban and Rural Households of Bangladesh during the Lockdown Period of COVID-19 Pandemic of 2020: Report of a Cross-Sectional Survey. *BMJ Open*, **10**, e043365. <https://doi.org/10.1136/bmjopen-2020-043365>
- [19] Ruszczyk, H.A., Rahman, M.F., Bracken, L.J. and Sudha, S. (2020) Contextualizing

the COVID-19 Pandemic's Impact on Food Security in Two Small Cities in Bangladesh. *Environment and Urbanization*, **33**, 239-254.

<https://doi.org/10.1177/0956247820965156>

- [20] Mandal, S.C., Boidya, P., Haque, M.I., Hossain, A., Shams, Z. and Mamun, A. (2021) The Impact of the COVID-19 Pandemic on Fish Consumption and Household Food Security in Dhaka City, Bangladesh. *Global Food Security*, **29**, Article ID: 100526. <https://doi.org/10.1016/j.gfs.2021.100526>
- [21] United Nations World Food Programme (2008) Food Consumption Analysis: Calculation and Use of the Food Consumption Score in Food Security Analysis. United Nations World Food Programme.
- [22] Kennedy, G., Ballard, T. and Dop, E. (2010) Guidelines for Measuring Household and Individual Dietary Diversity. Food and Agriculture Organization (FAO).