



Bangladesh University of Engineering and Technology

A Report on  
Activity Pattern of University Student During COVID-19  
Pandemic in Bangladesh

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## **ABSTRACT**

Novel Coronavirus disease 2019 (COVID-19) was first found in China that has now turned into an ongoing pandemic and life-threatening highly infectious disease thought the whole world. Like other countries, the people of Bangladesh are also at high risk of COVID-19 since the beginning of getting the first COVID-19 case here in mid-march 2020. This shock has already led to a massive social, human, economic crisis with experiencing various socio-economic, physical health, and psychological consequences. To understand the situation, many researches have been done already. But study related to activity pattern of the university students in Bangladesh has not been conducted yet. To fulfil the gap, this study has been done.

This study explores the activity patterns of the public university's undergrad-students of Bangladesh in two temporal dimensions (lockdown period and non-lockdown period) during COVID-19. To explore the objectives well, necessary data was collected through doing an online survey. The survey was conducted for 25days and finally the data were collected and compiled in Microsoft excel. After collecting so, the final analysis was done by following required procedures. Besides, necessary calculation, graphs, charts, frequency and point estimations have been used that has made it possible to quantify the relative changes of their activities with capturing the associated heterogeneity from gender to gender, higher income group to middle income group to lower income group and from one studying period to another one. The results will be useful for doing any further research or for predicting the 'new-normal' activity pattern of the students if any planners and policymakers will work on policy making programs or formulating effective restriction measures.

## **TABLE OF CONTENTS**

<b>ACKNOWLEDGEMENT.....</b>	<b>i</b>
<b>ABSTRACT.....</b>	<b>ii</b>
<b>TABLE OF CONTENTS.....</b>	<b>iii-vi</b>
<b>LIST OF TABLES.....</b>	<b>vii</b>
<b>LIST OF FIGURES.....</b>	<b>vii-viii</b>
<b>LIST OF ABBREVIATION.....</b>	<b>ix</b>
<b>CHAPTER 1: INTRODUCTION.....</b>	<b>1-3</b>
1.1 Background of the Study.....	1
1.2 Objectives of the Study.....	2
1.3 Rationale of the Study.....	2
1.4 Scope and Limitation of the Study.....	3
1.5 Organization of the Report.....	3
<b>CHAPTER 2: LITERATURE REVIEW.....</b>	<b>3-6</b>
2.1 Scenario COVID-19.....	3
2.2 Concept and Operational Definitions Related to the Study .....	4-5
2.3 Study Related to Student Activity and COVID-19.....	5-6
<b>CHAPTER 3: METHODOLOGY.....</b>	<b>6-8</b>
3.1 Self Review.....	6
3.2 Population Fixation.....	6-7
3.3 Preparation of Co-ordination Schema.....	7

3.4 Preparation of Sample design.....	7
3.5 Preparation of Questionnaire for Pretesting.....	7
3.6 Conducting Pretest.....	7
3.7 Preparation of Final Questionnaire.....	7
3.8 Conducting Final Survey.....	8
3.8.1 Data Collection.....	8
3.8.2 Database Preparation and Data Compilation.....	8
3.8.3 Data Analysis and Interpretation.....	8
3.9 Final Report Preparation.....	8
<b>CHAPTER 4: STUDENT PROFILE ANALYSIS.....</b>	<b>9-11</b>
4.1 Socio-Economic Condition.....	9-10
4.2 COVID-19 Situation.....	10
4.3 Educational Information.....	10-11
4.4 Information about Online Class.....	11
<b>CHAPTER 5: ACTIVITY ANALYSIS DURING LOCKDOWN .....</b>	<b>11-13</b>
<b>CHAPTER 6: ACTIVITY ANALYSIS DURING NON-LOCKDOWN .....</b>	<b>13-15</b>
<b>CHAPTER 7: ACTIVITY COMPARISON DURING BOTH PERIODS .....</b>	<b>15-22</b>
7.1 Spending Approximate Time behind Study Other than Class.....	15
7.2 Spending Approximate Time on Other Online Activities.....	16
7.3 Spending Approximate Time on Online Work.....	16

7.4 Spending Approximate Time Behind Sleeping.....	17
7.5 Spending Approximate Time Behind Helping Family Members in Household Works.....	17
7.6 Spending Approximate Time with Family.....	18
7.7 Spending Approximate Time on Studying.....	18
7.8 Spending Approximate Time for Recreation (Watching TV, Indoor Game).....	19
7.9 Spending Approximately Time in Physical Exercise.....	19
7.10 Spending Approximate Time at Outside the Residence.....	20
7.11 Travelling Frequency of Long Distance.....	21
7.12 Engaging in Part Time Job.....	21
7.13 Frequency of Visiting Relatives/Neighbors/Friends .....	22

**CHAPTER 8: ACTIVITY PATTERN AND SOCIO-ECONOMIC RELATIONSHIP DURING BOTH..... 22-26**

**CHAPTER 9: MAJOR FINDINGS, RECOMMENDATION AND CONCLUSION ..... 26-29**

9.1 Major Findings and Recommendation .....	26-27
9.2 Conclusion.....	28-29

**LIST OF REFERENCES..... x-xiii**

<b>APPENDIX.....</b>	<b>xiv-xxv</b>
A: Final Co-ordination Schema.....	xiv-xvi
B: Final Questionnaire.....	xvii-xx
C: Activity Surveyed.....	xxi
D: Sankey Diagrams.....	xxii
E: Mosaic Graphs.....	xxv
<b>GLOSSARY.....</b>	<b>xxvi</b>

## LIST OF TABLES

Table1: Monthly Income, Gender and Living Area .....	9
Table2: Holding online classes at lockdown and at any period; holding online exam...	11

## LIST OF FIGURES

Figure1: Residing area of the students.....	9
Figure2: Residing place of the students.....	9
Figure3: COVID-19 and residing area.....	10
Figure4: Influencing typology by COVID-19 of students and their family.....	10
Figure 5: Time behind online classes.....	11
Figure 6: Spending time behind study other than class.....	16
Figure 7: Spending time behind other online activities.....	16
Figure 8: Spending time behind on online work.....	17
Figure 9: Spending time behind sleeping.....	17
Figure 10: Spending time behind helping family.....	18
Figure 11: Spending time with family.....	18
Figure 12: Spending time on studying.....	19
Figure 13: Spending time on studying.....	19
Figure 14: Spending time in physical exercise.....	19
Figure 15: Frequency of going outside.....	20
Figure 16: Causes behind going outside.....	20
Figure 17: Travelling long distance.....	21
Figure 18: Engaging in part-time job.....	21



Figure 19: Frequency of visiting relatives/neighbors/friends.....	22
Figure 20: Online activity and their residential area.....	22
Figure 21: Income and part time job.....	23
Figure 22: Earning member and part time job.....	23
Figure 23: Family member and part time job.....	23
Figure 24: Average day of a male and female during non-lockdown.....	24
Figure 25: Average day of a male and female during lockdown.....	25
Figure 26: Average day of a respondent during lockdown and non-lockdown periods.	25

## **LIST OF ABBREVIATIONS**

IEDCR – Institute of Epidemiology, Disease Control and Research

UGC – University Grants Commission of Bangladesh

BBS – Bangladesh Bureau of Statistics

MNL – Multinomial Logit

NL – Nested Logit

## CHAPTER 1: INTRODUCTION

---

**1.1 Background of the Study:** COVID-19 case was first found in Wuhan, Hubei province of China in December-2019 and is seen now everywhere throughout the world (Rahman et al., 2020). On 30 January, 2020, World Health Organization declared COVID-19 as a global health emergency (Velavan and Meyer, 2020). In the second week of March 2020, WHO declared COVID-19 as global pandemic (Islam et al., 2020). Though it had been found in 2019 first, the first case of COVID-19 in Bangladesh was confirmed on 8<sup>th</sup> March 2020 (Rahman et al., 2020). Since after Bangladesh government started to take necessary steps to address the situation. Many countries who started to face corona before Bangladesh, had locked down many activities if necessity was aroused (Anwar et al., 2020). Like those, government of Bangladesh also declared lockdown to minimize the spread of this Virus and extended it many more time since its beginning. The first lock down period was from March 26, 2020 to the mid of June 2020 that continued till 30 may of that year. Physical classes of educational institutions were closed since March 18, 2020 (Islam et al., 2020). According to the times of India Bangladesh government declared lockdown again from 5<sup>th</sup> April, 2021 to 6<sup>th</sup> June, 2021 (The Times of India, 2021a) and imposed shutdown from 1<sup>st</sup> July 2021 to 14<sup>th</sup> July 2021 and extended it after Eid-ul-Adha to 5<sup>th</sup> August (Business Standard, 2021). Going outside, travelling long distance and many office activities were banned during lockdown periods (Anwar et al., 2020).

Though Bangladesh government locked down many activities many times since the beginning, it did not impose any strict protocol initially. At that time, millions of people, especially in Dhaka, were out on the streets (Anwar et al., 2020). This ultimately led Bangladesh to a worse situation. Then the government started to spread more awareness with taking more initiatives. Besides, many other organizations have been working too. Wearing a protective suit, isolation gown, goggles, shoe covers, surgical mask with face shields, maintaining social distance, washing hands regularly and many other pre-cautionary activities are being told to be followed to protect people (He et al., 2020). Thus, COVID-19 has brought many changes in general people's pre-cautionary activities. Moreover, the pandemic has resulted in disruptive changes in people's day-to-day activity patterns too (Nicola et al. 2020). Many physical works have been changed into online based activity. These changes have not been brought only to promote the restrictions that have been imposed by the Government but also to maintain personal awareness to protect themselves and others (Bucsky, 2020). Besides, maximum people are now less interested than before to visit public spaces, plazas or shopping centers and interacting with others (Honey-Rosés et al. 2020). Changes in travel behavior has also been noticed that

include shifting mode of transportation, reductions in trip numbers and trip lengths (Bhaduri et al. 2020). Such kinds of unprecedented changes and challenges suggest that it is necessary to gain a better understanding of the emerging behavioral pattern of people in order to make any new sustainable policy or planning for the ‘new-normal’ (Zannat et al., 2021).

As the outbreak of corona in Bangladesh has brought many changes in a person’s day to day life as mentioned above, the changes may naturally affect the activity patterns of a student too. Studies have been done on mental health, sedentary behavior and attitude of the students or general people during COVID-19 pandemic situation. But study related activity pattern of university students has not been done before in Bangladesh. It is assumed that this pandemic isn’t going away easily and immediately. So, it is important to find out the activity patterns of university students during the pandemic situation and the relation of those with the socio-economic condition in order to understand their new-normal behavior. This study deals with the activity pattern and the relationship between activities and socio-economic condition of the university student during the lockdown and non-lockdown period that may help other researchers to do further research and the government while taking any policy for the students.

**1.2 Objectives of the Study:** The objectives of the study are –

- 1) To identify the general activities of the university students of Bangladesh during the non-lock down period of COVID-19 due to enforced closer of universities
- 2) To identify the activities performed by the university students of Bangladesh during the enforced lockdown due to COVID-19
- 3) To find out the relationships between activities and socio-economic condition

**1.3 Rationale of the Study:** World Health Organization (WHO) declared the outbreak of novel coronavirus-2 (nCoV-2) as a pandemic and an international public health emergency that the entire world has been working to address it (Anwar et al., 2020). On March 8, 2020, three cases of COVID-19 were confirmed for the first time in Bangladesh too by the Institute of Epidemiology, Disease Control and Research (IEDCR) and now patients are being found in all 64 districts of the country (Islam et al., 2020). Besides, COVID-19 has a noticeable influence on students (Khan et al., 2020). The study is also focused on university students of Bangladesh and their activity change during this pandemic. Any study on exactly this topic has not been done before though study related to students’ psychological changes, changing education process and on many other topics have been done. So, such a study is required which will analysis student’s overall activity during the pandemic that may help to do further research.

**1.4 Scope and limitation of the Study:** The study focuses only on the activity pattern of the public university students of Bangladesh during pandemic that does not portray the activity pattern of any school, college going student or general people. So, changing the operational definition of population, further study is possible. Besides, as the study focusses only the activity patterns. So, broader study can be done on the effect of Corona on their physical and mental health, financial change analysis, social life or on other topics that have not studied yet. The study is done using stratified and simple random survey technique. So, only known people were used as sample that has made the study biased to some extent. Due to corona situation, physical survey was not possible to conduct. So online questionnaire was the only available tool. But for conducting a good report, FGD or any physical survey is important. The study focusses only on the pandemic situation that it could not show any comparison of the changes of activity pattern during COVID and before COVID situation. The report wanted to bring many more information that it could not due to time and other constraints. The limitations may work as scopes for any further research.

**1.5 Organization of the Report:** The report is organized into 9 chapters from introduction to conclusion with having chapters on lockdown, non-lockdown periods, comparison between these two periods and analyzing relationship of activities with socio-economic condition. Chapter 9 has given necessary recommendations too.

## **CHAPTER 2: LITERATURE REVIEW**

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In Bangladesh, COVID-19 was first seen on 8 March, 2020 and the affected persons were Bangladeshi immigrants who returned from Italy to their native place at that time (Rahman et al., 2020). Since that, Covid-19 started to spread and many times it took its serious turn that the government had to order for enforced lockdown to ensure the safety of the people. This period was repeated in several phases at the time of its high infection rate. Dhaka Tribune mentioned that in mid-March of 2020, the Education Ministry of Bangladesh had closed all educational institutions. They has planned to keep universities closed until the infection rate reaches or drops below 5% (Dhaka Tribune, 2021). At the closing of universities physical classes, many universities started taking online classes. This new environment, COVID situation, lockdown and others together may bring a change in the activity pattern of students that the study has analyzed. To analyze, necessary operational definitions were fixed.

**2.1. Scenario of Covid-19:** Coronavirus is a severe acute respiratory syndrome (SARS-CoV-2; formerly called 2019-nCoV) that was announced as a global pandemic on 11 March, 2020

by WHO (Cennimo, 2021). According to WHO, Symptoms of COVID-19 are fever, cough, shortness of breath, pneumonia and even death too (WHO, 2020b). Islam and his co-writers showed that within August 11, 2020, 20417,377 people were infected by this disease and has resulted in about 742,311 deaths globally (Islam et al., 2020). The recent scenario is depicted by Worldometer where they showed that there were 194,987,079 corona cases throughout all the countries till July 26, 2021 of what 1,179,827 cases were from Bangladesh (Worldometer, 2021). Though infection rates remained low apparently till the end of March in Bangladesh, a steep rise in cases started to be seen since April 2020. Besides, since the beginning many public health protocols are being implemented to control the spread of the virus, like social distancing, hand washing, lockdown procedures and so on (Ferdous et al., 2020). Population who faces double burden of diseases, for example: non-communicable diseases like diabetes, cardiovascular diseases, hypertension, malnutrition, chronic respiratory diseases and cancer, and communicable diseases like tuberculosis, tetanus, malaria, measles, rubella, leprosy and so on are at high risk of affecting by corona (Islam et al., 2020).

**2.2 Concept and Operational Definitions Related to the Study:** To collect and analyze data, few operational definitions as follows were fixed before conducting questionnaire survey.

*Non-Lockdown Period:* Since mid-march of 2020, the government of Bangladesh had announced general holidays in the wake of the pandemic and shut all the educational institutions at late-march that is being continued till now (Abdullah, 2020). For the study, the time when many governments, non-government, private, public institutions and office, markets, shops, public and private vehicles were open except educational institutions is called the Non-lockdown Period (Except lockdown periods since March 27, 2020).

*Lockdown Period:* As per the instruction of Government of Bangladesh, the 1<sup>st</sup> nationwide lockdown period was from 27<sup>th</sup> March, 2020 to 30<sup>th</sup> May, 2020 (Islam et al., 2020). The lockdown period imposed and extended many more times after that. From 5 April, 2021 to 23 May, 2021, there was another enforced lockdown period in Bangladesh (The Times of India, 2021a). Later it was extended till 6 June, 2021 (The Times of India, 2021b). The shutdown period started from July 1, 2021 and continued to one week (Business Standard, 2021). During this period, without emergency service like health, media, etc. government, non-government, private institutions, and office, markets, shops, public and private vehicles were closed. Anadolu Agency showed that, Farhad Hossain, State Minister for Public Administration, stated that lockdown had strict restrictions on transportation where no vehicles would be allowed on

roads except for emergency needs (Kamruzzam, 2020). For this study, both lockdown and shutdown periods were considered as enforced lockdown period.

University Student in Bangladesh: A university is an institution that offers undergraduate and graduate degrees to students and students who take such degrees are known as university students (College Rank, n.d.). According to UGC, there are 49 public universities in Bangladesh (UGC, n.d.). For the research, the undergraduate students of public universities of Bangladesh are considered by the term ‘university student’, no post graduate, medical college, national college and private university’s students were kept in consideration.

Online Activity: This term includes both types of online activity - academic and non-academic. Non-academic activities are reading news, using any type of social media (Facebook, YouTube or others), online entertainment, online gaming, online work. The study has considered these as online activities only when they had to use any electronic media for doing so. As the physical classes of universities are closed since the outbreak, Zoom, Microsoft Teams or many other apps have been used to conduct classes that have been considered as online classes.

Indoor Activity: As indoor activities, the report has considered few activities that students can take part inside their houses. Sleeping, helping family members in household chores, spending time with family, study, recreation (watching TV or playing indoor game), physical exercise etc. are defined as indoor activity for this report.

Outdoor Activity: Times spending outside the residence, travelling long distance, visiting to friends/ neighbors/ relatives are defined as outdoor activity for this report. Eating, essential shopping, tuition, meeting friends, medical emergencies, outdoor games and others are mainly considered as simple variables of reasons behind going outside.

Lower income group: If monthly household income is below 50,000 BDT

Middle income group: If monthly household income is in between 50,000 to 100,000 BDT

Higher income group: If monthly household income is more than 100,00 BDT

**2.3 Study Related to Student Activity and COVID-19:** Many literatures have been written on students and COVID-19 that are mainly focused on students’ mental health and change of attitudes. Some reports are written on activity pattern, but these are done focusing on other countries than Bangladesh. For example - a study on physical activity and sedentary lifestyle of university students in Spain has been done through surveying 230 health sciences student whose average year was 20.5 years (Blenco et.al., 2020). They have observed a noticeable

increase in doing physical exercise on lockdown period where female spent more time on an average. Another study in Spain has been done on college going students determining the physical activity, using tendency of smartphone, sleeping patterns and sedentary and showed that students spent more time behind these during lockdown period. Besides students took less physical exercise with sitting more, spending more time using smartphones and sleeping more hours than what they spent before COVID-19 (Sanudo et al., 2020). Gallo, Sophia and their co-writers have done another study on energy intake and physical activity of Australian University students that included students from three different years 2018, 2019, 2020 (Gallo et al., 2020). Zannat and her co-authors have studied on shopping behavior of the people of India and Bangladesh (Zannat et al., 2021). Abdullah and his co-researchers studied the travel behavior of people during the pandemic (Abdullah et al., 2020). Another study has been done in Netherlands on activity changes and travel behavior during COVID-19 (Haas et al., 2020). Thus, many other studies were overviewed.

## **CHAPTER 3: METHODOLOGY**

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*3.1 Self Review:* To understand which methodology would be beneficial for the study, many literatures were studied first that helped to develop an effective co-ordination schema too to get idea on which variables should be considered. Researchers have followed many diversified methods for their researches. Zannat and her co-authors used Sankey diagram to portray the findings with calculating through RP-SP methods, MNL model and NL formulation (Zannat et al., 2021). Islam and his co-authors performed descriptive statistics (e.g., frequencies, percentages, means, standard deviations) and some first-order analyses techniques (e.g., Chi-square tests, Fisher's exact tests) where their focus was to analyze data related to infected people (Islam et al., 2021). Another study on the meteorological factors on COVID-19 cases in Bangladesh was conducted where quasi-Poisson lag-based DLNM model was used to see the relationship of MaxT, MinT, DT, WS, RH and AH (Islam et al., 2020). Saha and Khan did their study using through a cross-sectional online survey (Saha and Khan, 2021). Babarro and his co-researchers studied the pattern of activity change simply following standard deviations and mean (Babarro et al., 2020). Besides, few researchers did their study using arithmetic mean and comparing the percentage behind many factors.

*3.2 Population Fixation:* The target population of this study were fixed as 'the undergraduate students of any public university of Bangladesh'. The students of private universities, medical



colleges, postgraduates or students from any national colleges or school were not considered as population. The population was fixed depending on its flexibility to conduct the survey.

3.3 Preparation of Co-ordination Schema: A coordination schema was prepared considering the studying population and self-review before collecting any data which worked as a frame that contained research query, complex variable, simple variable, how the data were to be collected and whether the data were qualitative or quantitative. It helped to assign the variables properly to fulfill the objectives and to identify proper level of measurement of those data. The variables were checked several times by trial-and-error methods so that those could properly reflect the objectives of the study. The first two objectives had same types of variables that helped to make a comparison of the two studying periods. Necessary variables were considered for the 3rd objective. The final co-ordination schema is provided in the appendix.

3.4 Preparation of Sample design: Before doing pilot survey, the sample was designed first. A sample frame was developed where the reachable female and male students were listed. From that list, in a stratified way, males and females were divided into two group. Finally sample students were collected in a simple random sampling procedure. Besides, by using sample size calculator, required confidence interval and margin of error was calculated.

Sample size = 410

Confidence Level = 95%

Confidence interval = 4.84

Margin of error = 5%

3.5 Preparation of Questionnaire for Pretesting: To assess the overall condition and fulfil the objectives of the study a questionnaire was prepared depending on the co-ordination schema. This questionnaire was prepared for the pretesting.

3.6 Conducting Pretest: A pretest was conducted by using the above questionnaire through preparing a google form. It was done on 30 students where the same sample designing procedure as above was followed.

3.7 Preparation of Final Questionnaire: After pretesting, it was found that the questionnaire required many noticeable changes depending on the reactions from the respondents. According to the response behavior, the questionnaire was edited several times to ease the respondent and finally a final questionnaire was prepared depending on the required changes that is provided in the appendix. A final google form was prepared through following that questionnaire.

3.8 Conducting Final Survey: The final google form was provided to the sample students of the study through mailing them and later other procedures were followed as below.

*3.8.1 Data Collection:* After conducting the survey for 25days, the data were collected. The study was conducted by using primary data collection method though COVID-19 related other required data were collected from secondary data sources; like- journals, newspapers and other authentic sources.

*3.8.2 Database Preparation and Data Compilation:* The google form generated an auto database depending on the responses. It was collected and edited accordingly. Among 429 data, 19 data were cleared by data clearing method as those were carrying wrong responses. For example – few respondents shared their phone number where they were supposed to share their age, another one responded only 2 questions among 29. Through omitting the unnecessary data, necessary frequency tables were generated by pivoting those data with the help of Microsoft excel.

*3.8.3 Data Analysis and Interpretation:* Using pivot tables, frequency tables and other qualitative and quantitative data many graphs and charts were prepared in excel and R Studio through generating necessary codes. The whole analysis was divided into five sections. In student profile, necessary information about students, household income, online classes and examination had been analyzed. Then, lock down and non-lock down related data were analyzed in the next section. After that, a descriptive analysis and comparison of the two periods were done. Necessary relation between the activities and socio-economic conditions were seen through combining various variables. Finally, a conclusion was drawn through analyzing the overall pattern of a student's activity during the two studying periods. The whole analysis was done diving into genders too to identify if the activity patterns varied from gender to gender.

3.9 Final Report Preparation: By following the above methods, the whole analysis was done that have been interpreted in the report. Then the final report was prepared that carries its necessary calculations.

- The arithmetic mean =  $\sum fx/N$   
Here, f =frequency  
x = Mid points  
N = total number of observations  
=  $\sum f$
- Necessary percentages of activities were calculated
- Sample size calculator was used to calculate confidence interval, confidence level and margin of error

## CHAPTER 4: STUDENT PROFILE ANALYSIS

**4.1 Socio-economic Condition:** The Study was conducted on 410 students among whom males were 233 and females were 177 in number where 280 students were from city corporation area which constitutes the largest share. Then comes Paurashava and Union area respectively. Both Paurashava and Union area occupies almost 1/4<sup>th</sup> of city corporation's residence [figure1]. 230 students are seen to live in owned-house which shares the

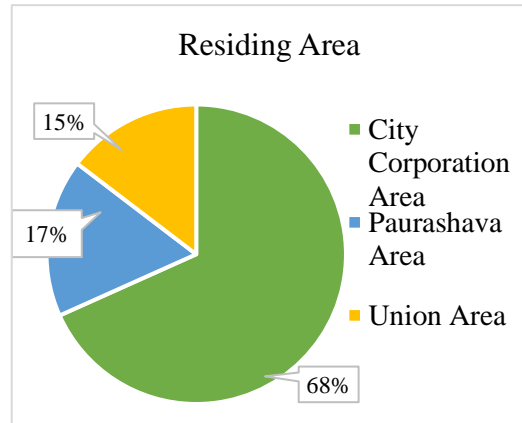


Figure1: Residing area of the students  
(online survey, 2021)

maximum portion. The 2<sup>nd</sup> highest was 159, these students are found living in rental houses. Maximum students of these two criteria were from city corporation areas. The rests were from university hostel, partly owned house, dormitory and government quarter [figure2]. Maximum

Table1: Monthly Income, Gender and Living Area (online survey, 2021)

Income (BDT)	Gender		Living Area			Total
	Female	Male	City Corporation	Paurashava	Union	
<10,000	14	16	12	8	10	30
10,001 to 20,000	15	33	21	10	17	48
20,001 to 30,000	37	53	56	19	15	90
30,001 to 50,000	52	58	83	16	11	110
50,001 to 100,000	46	54	79	14	7	100
>100,000	13	19	29	3		32
Total	177	233	280	70	60	410

of the respondents responded that they had a household income within 10000 to 100000, and the arithmetic average of it is about 40000 BDT. A large group of 110 students occupied maximum share of 30000 to 50000 BDT per month. Students who had higher monthly

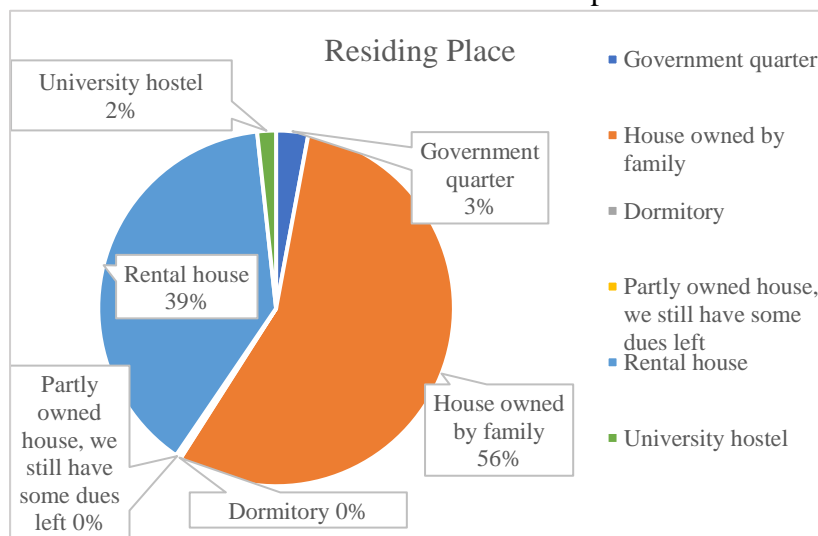


Figure2: Residing place of the students (online survey, 2021)

household income are seen to live in city corporation areas mostly than the other two. Besides, no student, who had more than 1lakh monthly household income, is seen to live in union area [table1]. The study has found out that maximum of the students belonged to a

nuclear family of 4 members. Most of the students had 5 family members where 20 students had more than 6 family members. Perhaps, as maximum of them was from nuclear family, most of them (263 students in number) had only one earning member in their house. 3 of them had more than 3 earning members which occupies only 0.73%. A huge variety is noticed in the occupations of the house-heads. The study has gotten 39 types of occupations where government service holders occupy the largest share. The 2<sup>nd</sup> and 3<sup>rd</sup> largest shares are occupied by private service and business respectively. 2 of them had unemployed household head.

**4.2 COVID-19 Situation:** Among the respondents, maximum of them/ their families had not been affected by COVID-19 that shares 72% (295 in 410 students) approximately. Maximum affected families are found living in city corporation area, then comes Paurashava and Union respectively. So, it is clear that the more the family

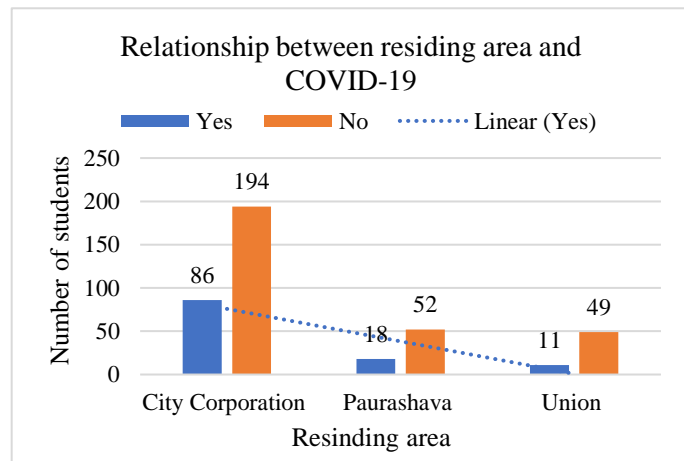


Figure3: COVID-19 and residing area (online survey, 2021)

is from any higher urban area, the more it has probability to get affected by corona. The trend tends to go down, the more it goes to union area from city corporation area [figure3]. Besides, both affected and non-affected students had been influenced in many ways that eventually influenced their activities too. The largest portion of them, 45% approximately, had suffered from economic loss. 3% of them had suffered from loss of job, losing one or more family

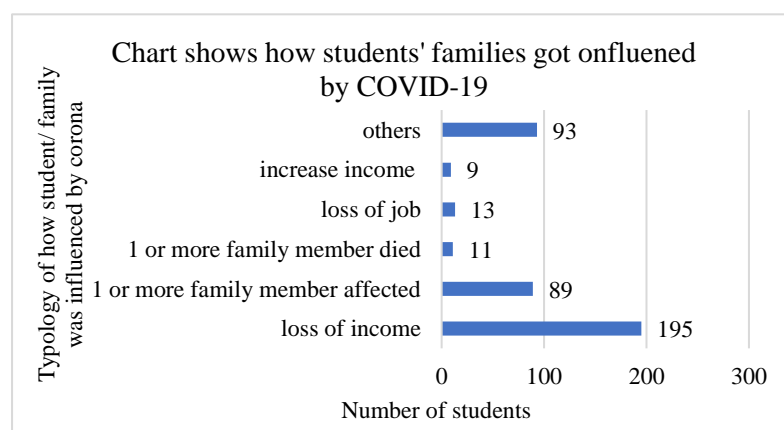


Figure4: Influencing typology by COVID-19 of students and their family (online survey, 2021)

member shares the 3<sup>rd</sup> largest portion which is about 2.6%. Few of them had been affected positively too. For example- 2.1% of them faced an increase in their household income. Others constitute 26% where mostly responded that they were not influenced.

**4.3 Educational Information:** Among 410 students, maximum of them was from BUET, KUET, CUET, BAU and DU. As sampling was done in stratified-simple random sampling

procedure, this selection was influenced by friends as per simple random sampling's characteristics. Other were from other public universities of Bangladesh (online survey, 2021).

4.4 Information about Online Class: The study shows that among 410 students, 408 went through their online classes though during lockdown/shutdown, this percentage went down. For maximum, online class was started during the middle of 2020 where COVID-19 started to spread since the mid-March of 2020 in Bangladesh. Besides, 58% of them responded that their

Table2: Holding online classes at lockdown and at any period; holding online exam (online survey, 2021)

Online class at lockdown		Online Class at any period		Holding Online examination	
N/A	18	N/A	0	N/A	0
No	92	No	2	No	172
Yes	300	Yes	408	Yes	238
Grand Total	410	Grand Total	410	Grand Total	410

university was arranging online examinations too where the rests did not arrange. Perhaps, ensuring fairness during online exam is a reason behind not arranging online exams in many universities, device or network problem could influence too. Moreover, 145 students spent 3 to 8 hours per week behind online classes during the two periods which is 35% of total. The 2<sup>nd</sup> highest is 83, who spent 8 to 15 hours per week. 77, 62, 39 students respectively spent more than 20, 15 to 20 and less than 3 hours/week.

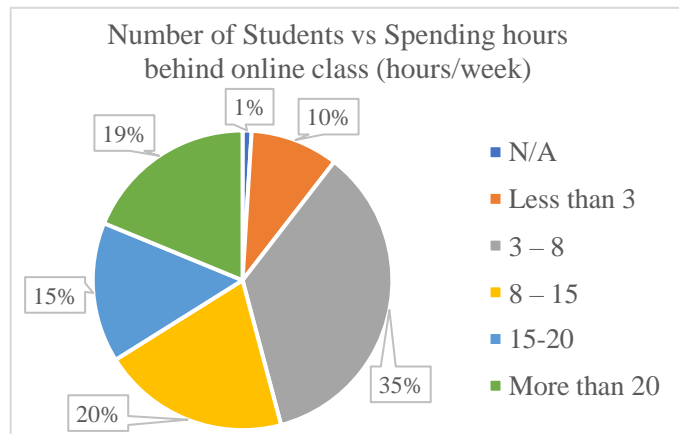


Figure 5: Time behind online classes (online survey, 2021)

## CHAPTER 5: ACTIVITY ANALYSIS DURING NON-LOCKDOWN——

5.1 Spending Time Behind Study Other Than Class: During this period, a girl spent about 2.5hours/day on this activity on an average where a male spent average 2.1 hours. Doing descriptive analysis, it is seen both groups studied more during this period than that of lockdown period where females had a higher tendency of studying more than males. 4.5% of girls spent more than 6 hours behind this activity where, for males, it was almost half of that, 2.5% only. 8% of them did not study at all during this period [Figure6].

5.2 Spending Approximate Time on Other Online Activities: The arithmetic mean shows that males and females spent respectively 2.9 and 2.5 hours/day behind this activity on an average. So, males spent more time behind this than females during lock down. Only 2% of them did not spent any time at all behind this activity [figure7].

5.3 Spending Approximate Time on Online Work: During this period, 33% female spent less than 1 hours/day for this activity. On the other hand, maximum boy spent time within 1 to 3 hours which is 29% of them. That indicates that boys spent more time on online work on an average than girls during this period. Besides, only 6% of them spent more than 6 hours that has much lesser frequency than other categories [figure8].

5.4 Spending Approximate Time Behind Sleeping: The arithmetic mean shows that girls spent 7 hours/day behind sleeping where boys spent 6.7 hours, means girls slept more during this period on an average. 3.4% of them slept even more than 10 hours/day [figure9].

5.5 Spending Approximate Time in Helping Family Members in Household Works: During this period, both girls and boys spent almost same amount of time behind this activity. The arithmetic mean of this is 1.7 hours/day for both groups, means both groups helped their families almost equally. Even 0.73% of them spent more than 6 hours/day for this [figure10].

5.6 Spending Approximate Time with Family: The arithmetic mean for this activity is 2.2 hours/day for both groups of female and male students, means both spent same amount of time with their family at this period. 33.33% of female spent 1 to 3 hours/day that constitutes the largest share. For male, largest share is 29.6% that is found in the same category [figure11].

5.7 Spending Approximate Time on Studying: During this period, female and male students spent respectively 2.3 and 2 hours/day, means girls studied more at this time. 82 female and 106 male students studied 1 to 3 hours/day that share the largest portion for both of the groups and these are 46.4% and 45.5% of them respectively [figure12].

5.8 Spending Approximate Time for Recreation (Watching TV, Indoor Game): The arithmetic means of this activity at this period are 1 and 1.6 hours/day for females and males respectively. Thus, the study shows that males spent 0.6 hours extra every day for recreation. Maximum of the males, 88 in number, spent 1 to 3 hours/day that shares the largest portion. Where the largest share from females is the category of less than 1 hour daily which constitute 30.1% of them. No girl spent more than 6 hours behind this task at this time [figure13].

5.9 Spending Approximately Time in Physical Exercise: A student spent 0.5 hours/day behind this activity at this time where a male or female individually spent 0.6 and 0.45 hours/day respectively, means a male spent 0.15 hour more for this activity at this time on an average. 92 female students did not spend any time at all that constitutes the largest share, 52%, among the

categories. But for males, largest sharing category is spending less than one hour everyday where 44% of them do so [figure14].

5.10 Spending Approximate Time at Outside the Residence: The study shows that, in total, 32% of them went outside 2 to 4 times in a week where boys share it more than girls. 28% of female went 2 to 4 times/week which is the maximum for them among the categories. 21% of them did not go outside even for once. 61% of boys went less than 4 times in a week that constitutes the largest share. Only 6% of them did not go outside at this period even for once which is 3.5 times smaller than that of girls. So, on an average, boys spent more time behind this activity during this period. Besides, the arithmetic mean shows that a girl spent 3.5 hours at outside in a week at this period that was 4 hours/week for boys. [figure15].

5.11 Travelling Frequency of Long Distance: Travelling tendency was almost same for both groups at this time. 55% female and 56% of male travelled less than 4 times during this period. 9% them travelled even more than 7times where majority of the share was from boys. 25% of them did not go anywhere at this period where both groups shared equally [figure17].

5.12 Engaging in Part Time Job: 61 female and 110 male students were engaged in this activity during non-lockdown that are 35% and 47% of them respectively. 58% of total did not do any part time job at this period. So, majority of them were not engaged in any part time job though male students had higher tendency of doing this activity. Students were engaged in tuition mostly. Besides a noticeable portion of them were engages in outsourcing too [figure18].

5.13 Frequency of Visiting Relatives/Neighbors/Friends: At this period 37% of female and 40% of male visited less than 2 times in a week that constitute the largest share. 66% of them visited less than 4 times where 5.6% of them visited more than 7 time that has a larger share from male students. On an average, boys visited more during non-lockdown period [figure19].

## **CHAPTER 6: ACTIVITY ANALYSIS DURING LOCKDOWN**—————

6.1 Spending Approximate Time behind Study Other than Class: During Lock down, a girl spent about 1.22hours/day behind this activity on an average where a male spent average 1.26 hours. Doing descriptive analysis, it is seen that both the male and female spent almost same amount of time. But 3% of boys spent more than 6 hours behind this activity where, for female, it was half of that, 1.5%. So, during lock down, boys studied more than girls under the category of ‘studying more than 6 hours in a day’. Number of male respondents is higher than the female, that influences the percentages to some extent [Figure6].

6.2 Spending Approximate Time on Other Online Activities: The arithmetic mean shows that males and females spent respectively 4.4 and 4.5 hours/day behind this activity on an average. So, both of the categories spent almost same time [figure7].

6.3 Spending Approximate Time on Online Work: During this period, 31% female spent time within 1 to 3 hours/day which was about 28% for boys. For both groups, this category constitutes the largest share. About 12% of them spent more than 6 hours during this period for this activity [figure8].

6.4 Spending Approximate Time Behind Sleeping: The arithmetic mean shows that girls spent 8.3 hours/day behind sleeping where boys spent 7.6 hours, means girls slept more during this period. 13% of the respondents slept more than 10 hours in a single day [figure9].

6.5 Spending Approximate Time in Helping Family Members in Household Works: During lock-down period, girls spent 2 hours/day behind this activity which was only 1.2 hours/day for boys, means girls helped their families more than boys during this period. Even 4.5% of female spent more than 6 hours behind this activity at that time where this percentage for boys was only 1.7% of them [figure10].

6.6 Spending Approximate Time with Family: The arithmetic means for this activity are 4.1 and 3.7 hours/day respectively for female and male students, means girls spent more time with family than boys at this time. 31% of female spent 1 to 3 hours/ day and another 31% of them spent more than 6 hours, these both constitute the largest share. For male, largest share is 27% who spent more than 6 hours/day [figure11].

6.7 Spending Approximate Time on Studying: During this period, female and male students spent respectively 1.3 and 1.4 hours/day on an average, means both groups studied almost same amount of time. 2.7% of them studied more than 6 hours/day at this time where 22.7% did not study at all. 34.5% of females studied 1 to 3 hours/day which constitutes the largest share where maximum boys, 34.76%, studied less than 1 hour/day [figure12].

6.8 Spending Approximate Time for Recreation (Watching TV, Indoor Game): The arithmetic means of this activity at this period are 2.3 and 2.4 hours/day for females and males respectively. Thus, the study shows that both of the groups spent same amount of time for this activity. Even about 7% of them spent more than 6 hours/day behind this task at this time. 12.2% of them did not spent time for it at all. Comparing with studies, it is seen that both groups spent more time on recreation than what they spent for studying [figure13].



6.9 Spending Approximately Time in Physical Exercise: A student spent 0.5 hours/day behind this activity at this time where both individual groups individually spent 0.46 hours/day, means both male and female spent equal amount of time. 79 female students did not spend any time at all that constitutes the largest share, 45%, among the categories. 42% of males did not spend any time and another 42% spent less than one hour/day [figure14]

6.10 Spending Approximate Time at Outside the Residence: The study shows that 60% of the female did not go outside even for once that shares the largest portion. The rest of them went maximum 7 times in a week and no girl did this activity more than 7 times. Though going outside unnecessarily was prohibited during this period, 35% of boys went less than 2 times in a week that constitutes the largest share and 5.6% of males went more than 7 times in a week. So, the descriptive analysis shows that boys did the activity more than girls at lockdown. Besides, the arithmetic mean shows that a girl spent 0.88 hours at outside in a week at this period that was 2 hours/week for boys, means boys spent double time of that of girls [figure15].

6.11 Travelling Frequency of Long Distance: Travelling tendency was higher among the boys where 0.8% of them travelled even more than 7 times at this period though travelling during lockdown was prohibited. 70% of female and 63% of males did not go anywhere at this period which constitute the largest share for both categories [figure17].

6.12 Engaging in Part Time Job: 67 female and 95 male students were engaged in part time job that are 38% and 41% of them respectively. 61% of total did not do any part time job at this period. So, majority of them were not engaged in any part time job. Besides, male students had higher tendency of doing this activity. Students were engaged in tuition mostly [figure18].

6.13 Frequency of Visiting Relatives/Neighbors/Friends: At this period 58% of female and 53% of male did not visited anywhere that constitutes the largest portion. Besides, such an output was predicted as going outside is strictly prohibited during lockdown. 41% female and 42% male visited less than 4 times where 1.7% of total visited more than 7 time that has a larger share from male students [figure19].

## **CHAPTER 7: ACTIVITY COMPARISON DURING BOTH PERIODS—**

7.1 Spending Time Behind Study Other Than Class: During lock down students studied 1.26 hours/day on an average that increased to 2.23 hours/day during non-lock down period. That means, during non-lock down period students studied more than lock down period. Keeping

many universities' online classes stopped during lock-down can be a reason behind such result. Besides, girls used to study more than boys during non-lock down where boys studied more during non-lock down on an average. Figure

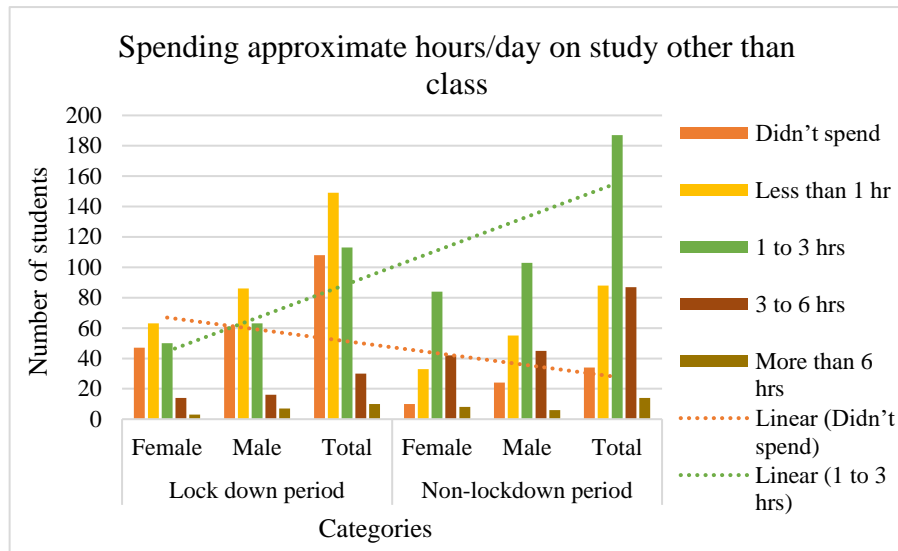


Figure 6: Spending time behind study other than class (online survey, 2021)

6 also shows so by using its trend line that number of 'not spending time' behind study decreased during non-lock down, but studying tendency increased during this period.

**7.2 Spending Approximate Time Other Online Activities:** This activity includes- reading news, using social media, online entertainment, online gaming but excluding online work. Figure 7 shows that during lock down students spent more time behind this activity which is 4.4 hours/day on an average. But in non-lock down period, it decreased to 2.7 hours/day. During non-lock down period more students had to attend online classes [figure6], perhaps that is why, they could manage less time than before at this period. Both males and females had lessened their spending time during non-lock down period, but the rate is higher for females than males. The trend line [figure7] shows that through the '3 to 6 hours/day' category decreased from lock-down to non-lock down period, spending 1-3 hours/day increased then, means the decreasing of overall spending time.

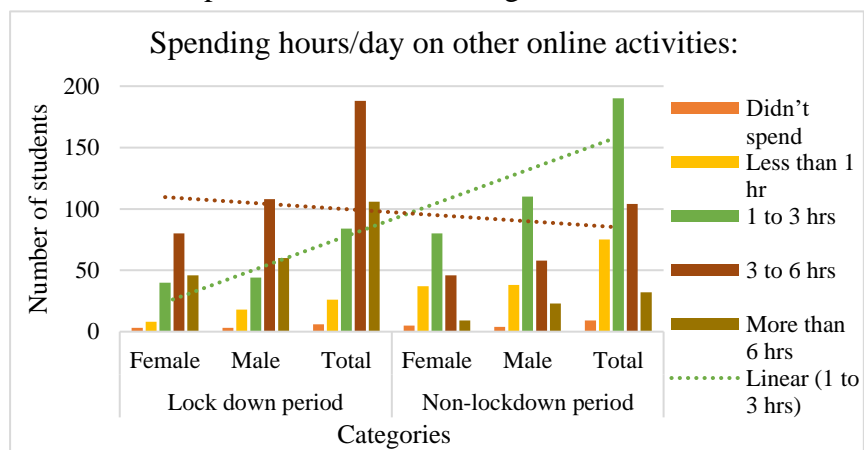


Figure 7: Spending time behind other online activities (online survey, 2021)

**7.3 Spending Approximate Time on Online Work:** The arithmetic mean shows that spending time for this activity was much higher, almost double, during lock-down period than that of non-lockdown period. For both male and female, it was 2.6 hours/day on an average that

reduced to 1.7 during lock-down period. A girl used to spend 2.5 hours/day where a boy spent 2.7 hours during lock-down period. During non-lock down period, arithmetic mean for a girl was 1.5 that was 1.9 for a boy. That means, girls scattered more than the boys because of changing the periods. Besides, there is not any time span for this activity when respondents spent noticeably high or low amount of time.

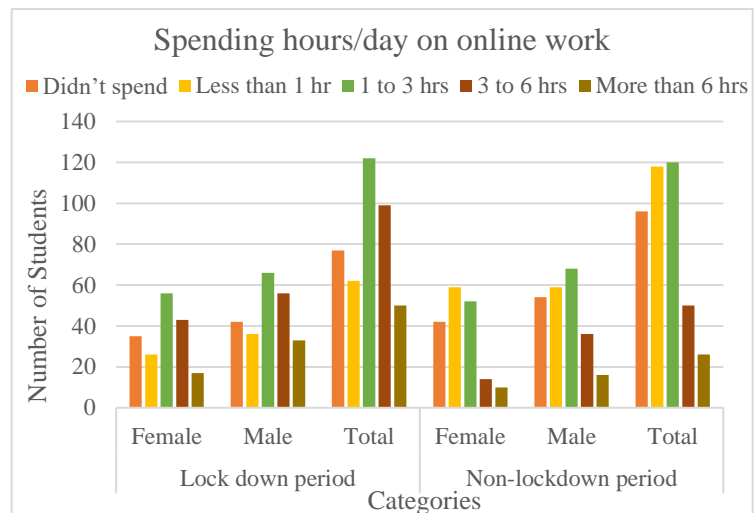


Figure 8: Spending time behind on online work (online survey, 2021)

#### 7.4 Spending Approximate Time

Behind Sleeping: Sleeping tendency got increased during lock down period that figure 9 shows by its trend lines. On an average, respondents spent 8 hours/day during lock down that was 6.8 hours during non-lock down. During lock down, doing many activities got stopped, perhaps that is why students could

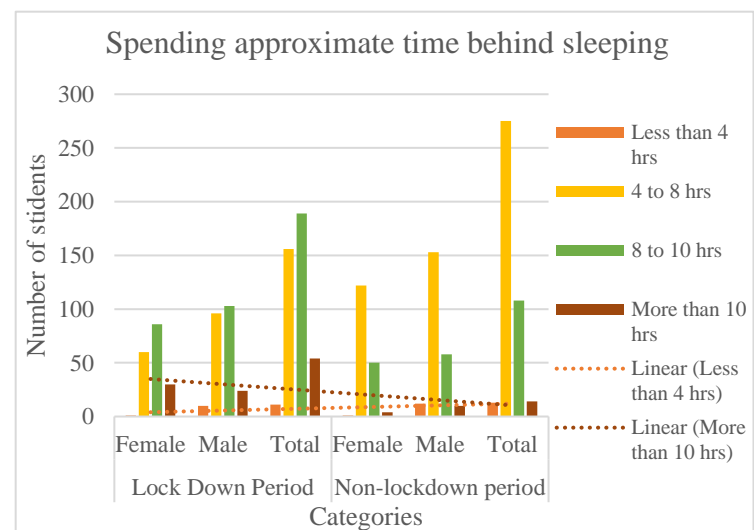


Figure 9: Spending time behind sleeping (online survey, 2021)

spend more time on sleeping then. Only 2.5% slept less than 4 hours/ day during lock down that was 3% during non-lock down, means students shifted from higher range to lower range of sleeping during non-lockdown period [figure9].

7.5 Spending Approximate Time in Helping Family Members in Household Works: Because of the socio-economic condition of Bangladesh, it was predicted that girls would help more than boys in household works. Though predicted output was not seen during non-lockdown, it was seen during lockdown period. The study shows that both groups spent almost same amount of time behind this activity during non-lock down period which is 1.7 hours/day on an average. 51% of them spent less than 1 hour behind this activity during that period. The predicted output was seen during lockdown period where girls spent almost 2 hours/day, but boys spent half of

that on an average. In total, a respondent spent about 1.5 and 1.7 hours/day on an average, respectively during lockdown and non-lockdown period. This shows that helping family in household activities had slightly a higher tendency in non-lock down period. Besides, girls had slightly more tendency of doing this activity.

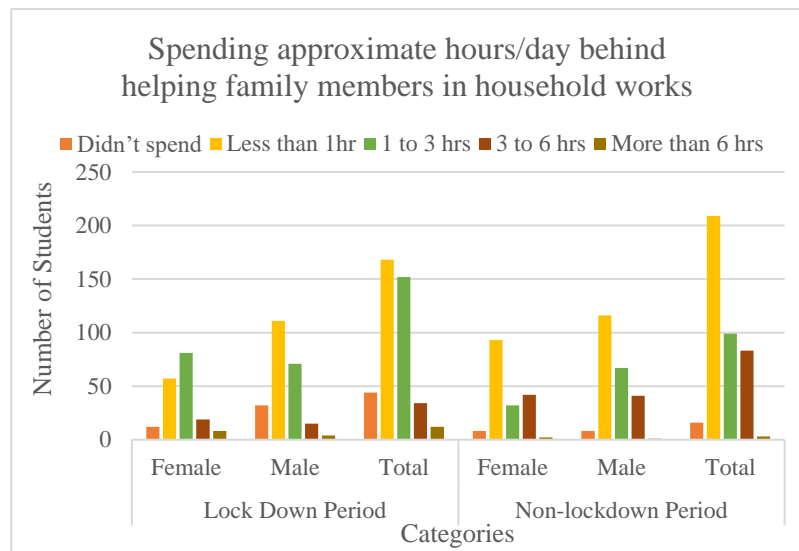


Figure 10: Spending time behind helping family (online survey, 2021)

**7.6 Spending Approximate Time/Day with Family:** The arithmetic mean of this activity for both groups are 3.9 and 2.2 hours/day respectively during lock down and non-lock down period, means students spent more time with their family during lock down. Perhaps, getting online classes stopped and not being able to go outside during lockdown increased the tendency of staying with their family. During both periods, girls spent more time with their family. Besides, 4.4% of them did not spent any time with their family during lock down, that increased to 14% during non-lock down period that is quite deviated from the average value [figure11].

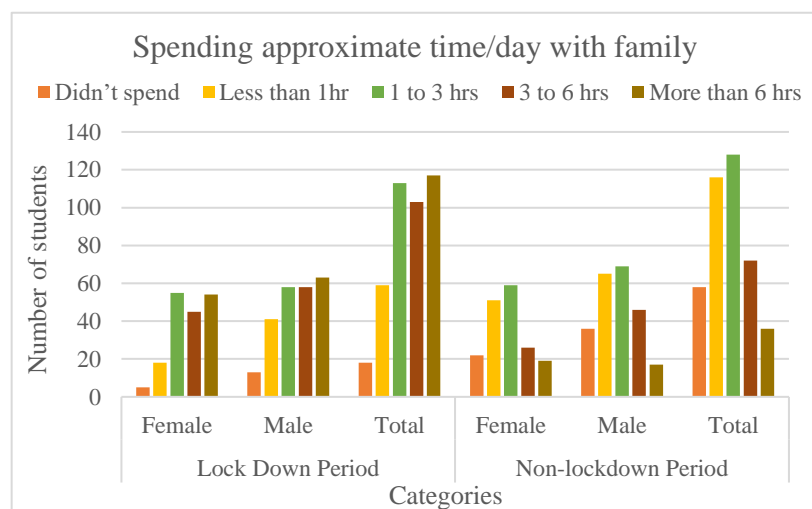


Figure 11: Spending time with family (online survey, 2021)

**7.7 Spending Approximate Time on Studying:** The overall studying tendency increased during non-lockdown period that is shown by the two arithmetic mean value and the following graph. During lockdown, spending time behind this was 1.4 hours/day on an average which was 2.1 hours during non-lockdown. Many university kept their online classes off during lockdown that can be a reason of such lower value at this time. 4% of them studied more than 6 hours at non-lockdown period that was half of this during lockdown. Even though both groups studied more during non-lockdown period, girls overall spending time increased more that was 0.9

hours extra than their previous one and it was 0.6 hours for boys, means that girls studied slightly more than boys when online classes started, though during lock-down period the tendency was slightly higher for the males [figure12].

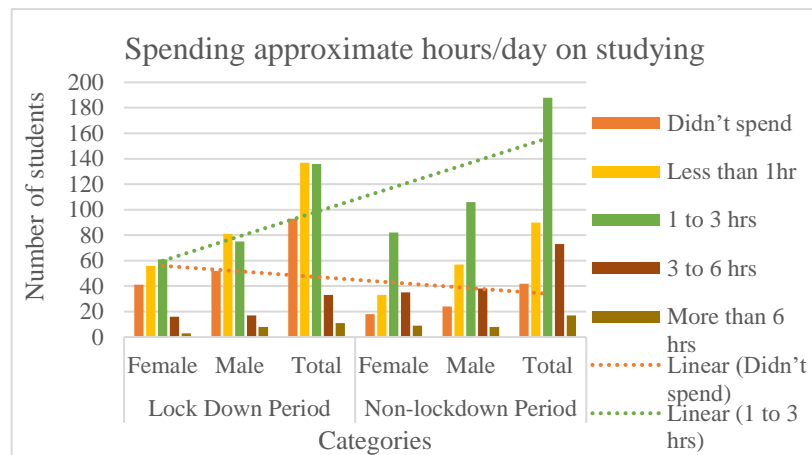


Figure 12: Spending time on studying (online survey, 2021)

**7.8 Spending Approximate Time for Recreation (Watching TV, Indoor Game):** The arithmetic means of this activity for lockdown and non-lockdown periods are respectively 2.4 and 1.4 hours/day which shows that students spent more time behind recreation during lock-down period. Perhaps, not holding online classes or not being able to go outside during lockdown gave them chances to spend more time behind this activity at this period. Besides, during both periods, boys spent more time for this activity. Even 3% of boys spent more than 6 hours/day behind this activity during non-lockdown period, where at that time, no girl spent so [figure13].

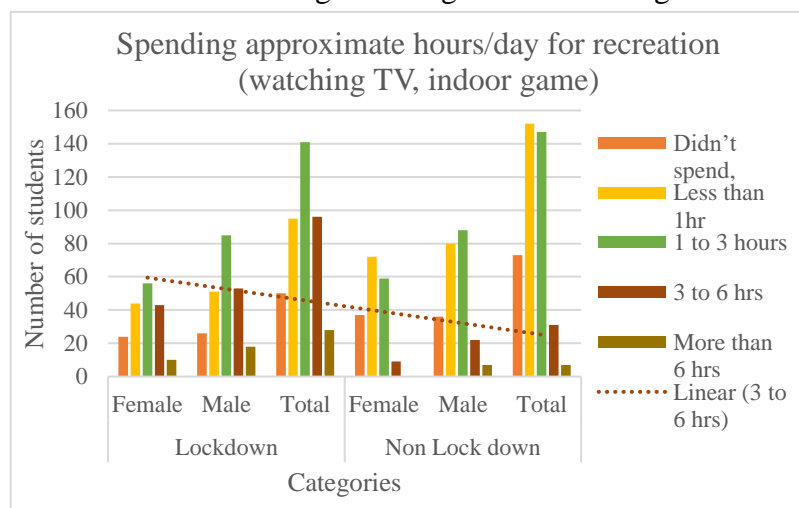


Figure 13: Spending time on studying (online survey, 2021)

**7.9 Spending Approximately Time in Physical Exercise:** During both periods, a student spent 0.47 hours/day which is only 2% of his day. It shows that very few students are interested in doing physical exercise. Moreover, during both periods, boys were slightly more interested in this activity. A large percentage of them did not spent any time

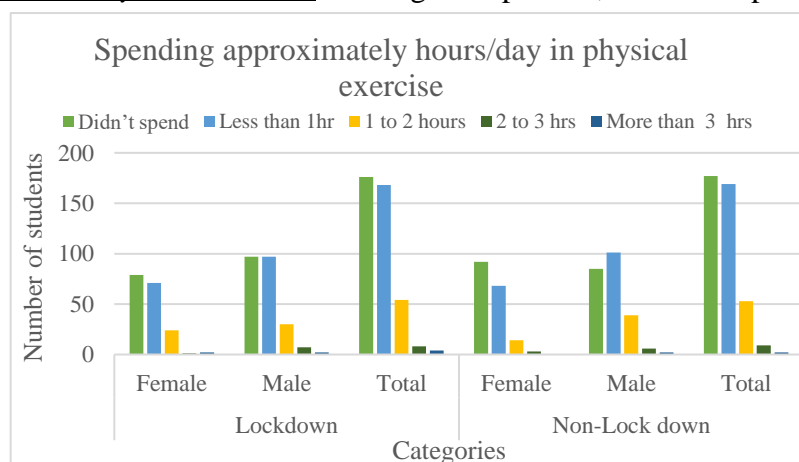


Figure 14: Spending time in physical exercise (online survey, 2021)

behind this activity that is 43% for both periods. 0.5% of them spent more than 3 hours for this during non-lock down that was 1% (means double) during lock down period [figure14].

### 7.10 Spending Approximate

#### Time/Week at Outside the

#### Residence:

Both qualitative -quantitative measurements have been done for analyzing this activity. The quantitative analysis shows that going outside was more prominent during non-lockdown period. 32% of

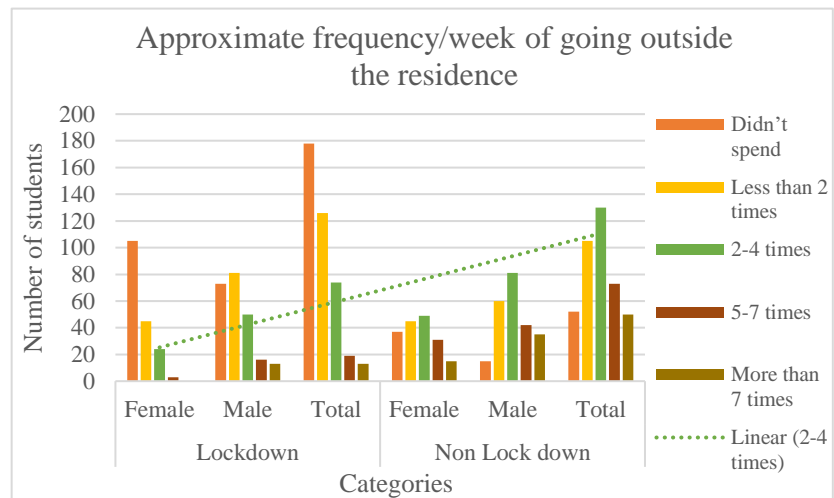


Figure 15: Frequency of going outside (online survey, 2021)

them want outside during non-lockdown period about 2 to 4 times in a week that was only 18% of them during lockdown period. 44% of them did not go outside during lockdown that was 13% during non-lockdown, means about 3x students went outside during non-lockdown than that of lockdown period. During both periods, boys had higher tendency to go outside than girls. No girl went outside more than 7 times in a week at the lockdown period where 3.2% of male did so, even though it was enforced lockdown period [figure15]. Besides, the arithmetic means shows that a respondent spent 1.5 and 4 hours at outside in a week respectively during lock down and non-lockdown period that also shows that tendency of going outside was higher during non-lock down.

The qualitative data has brought out the reasons behind going outside. A student naturally chose more than only one reason behind this activity. During non-lockdown majority of them went outside in order to

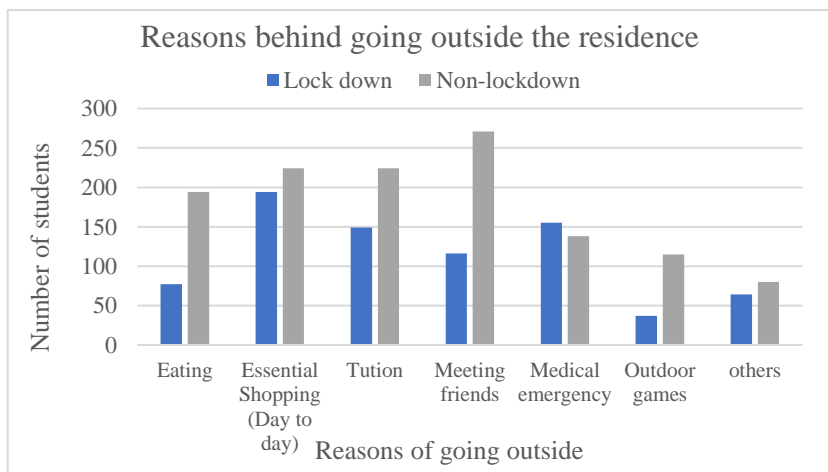


Figure 16: Causes behind going outside (online survey, 2021)

meet friends where essential shopping and medical emergency were the prominent one during lock down which also indicates that maximum of them went outside during lockdown because of any necessity. A larger portion of them went outside for eating during non-lock down period that noticeably reduced during lock-down [figure16].

### 7.11 Travelling Frequency of

Long Distance: The study shows that students travelled more frequently during non-lock down period than that of lockdown period. 66% of them did not go anywhere at lock down which reduced to 24% during non-lockdown period, means 2.75 times

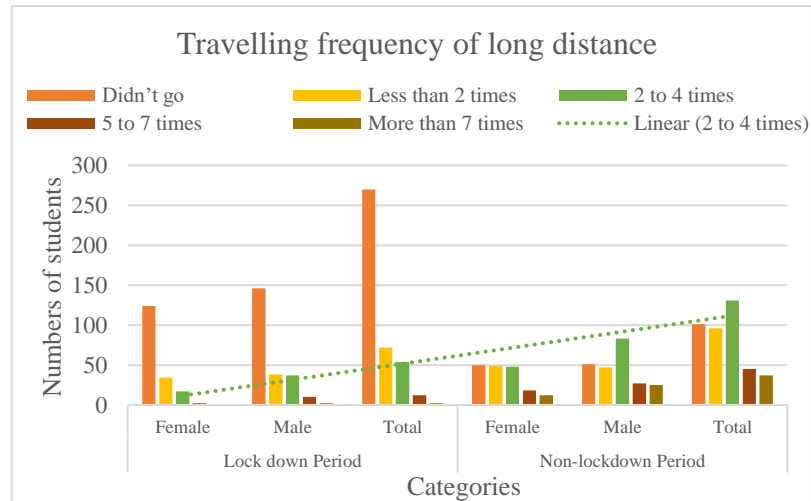


Figure 17: Travelling long distance (online survey, 2021)

lesser than the previous one. 32% of them travelled 2 to 4 times during non-lockdown that constitutes the largest share where it was only 13% during lockdown. 9% of them went even more than 7 times during non-lock down that was only 0.4% at lockdown period. Though overall frequency was higher at non-lockdown period for both groups, boys did this activity more than the girls during both periods that figure17 also depicts.

7.12 Engaging in Part Time Job: Analyzing the variable, it is seen that 162 students were engaged in any types of part time job during lockdown period which is 39.5% of them that raised to 42% during non-lockdown. So, the overall scenario depicts that the activity did not differ that much with the changing of periods. The rest 2.5% who worked during non-lockdown but did not do so during lockdown, perhaps they lost their job or they did not continue at that time as COVID situation was worse then. Though the overall percentage increased during non-lock down, individually for girls, it reduced at this period. But boys engaged more in this activity during non-lock down than that of lock down. The qualitative analysis depicts that majority of them were engaged in tuition as part time job that was 69% of engaged students in any type of job during lockdown period that was 79% during non-lockdown period. Girls were mainly business and tuition oriented where boys had a strong tendency of doing outsourcing beside the mentioned two. Some of them were engaged in more than one job [figure 18].

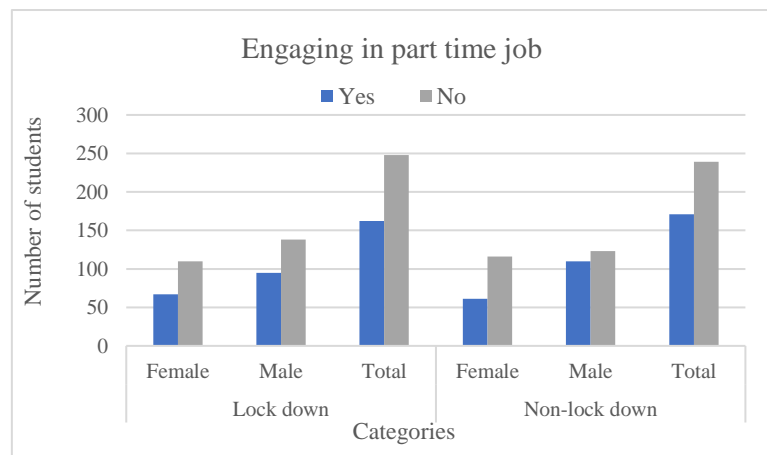


Figure 18: Engaging in part-time job (online survey, 2021)



**7.13 Frequency of Visiting Relatives/Neighbors/Friends:** Among the students 55% did not visit anywhere during lockdown that tendency noticeably reduced to 18% during non-lockdown, means students visited more at non-lockdown period. During both periods, males had higher tendency of visiting where 7% and 2.5% of male visited even more than 7 times during non-lockdown and lockdown respectively. 43.17% of them visited less than 7 times during lockdown that noticeably increased to 77% during non-lockdown. Besides, during both periods, males visited more than females on an average [figure19].

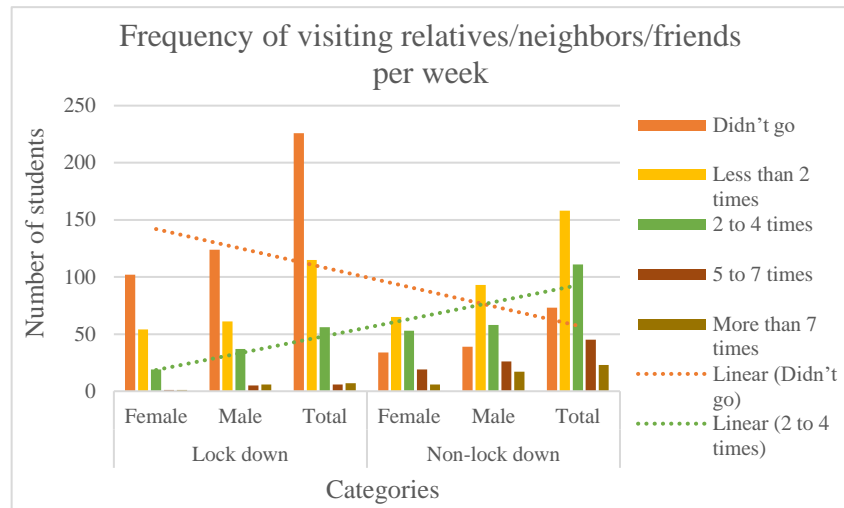


Figure 19: Frequency of visiting relatives/neighbors/friends (online survey, 2021)

## CHAPTER 8: ACTIVITY PATTERNS AND SOCIO-ECONOMIC RELATIONSHIP DURING BOTH PERIODS

**8.1 A Relation Between Online Activity and Their Residential Area:** 27.5% students of city corporation area spent 1 to 3 hours/day behind online activity that shares the maximum portion during lock down and it was 29% during non-lockdown. This category shared the largest share at the time of Paurashava during both periods too and for union area during lockdown period. But during non-lockdown, students of union area lessened the spending time. Arithmetic mean shows that it was 1.6 hours per day at that time. Besides, it is clear through analyzing the graph too that during both period, students of city corporation area spent more time behind online activity. The more it goes to city corporation to union area the less the tendency is. On an average a noticeable share goes behind this.

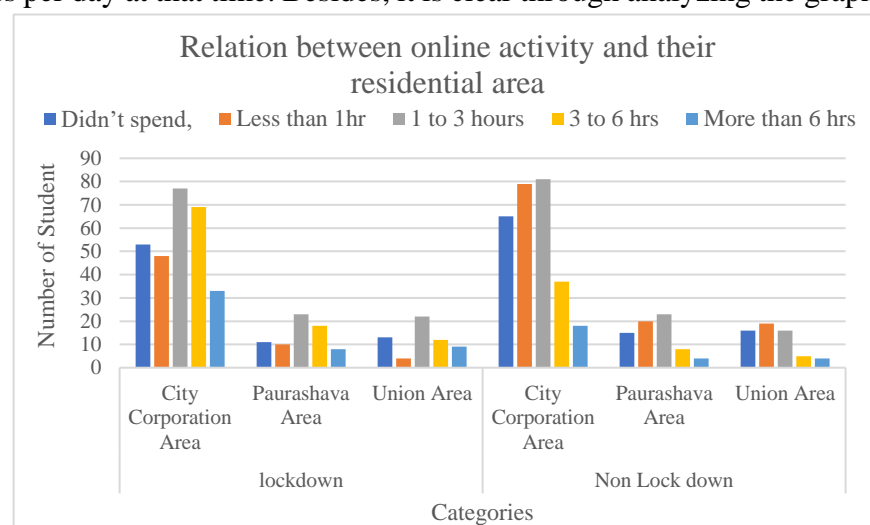


Figure 20: Online activity and their residential area (online survey, 2021)



## 8.2 Relationship Between Household Income and Part Time Job Considering Gender:

Gender: Analysis the relationship, it is seen that tendency of doing part time job is higher among those who are from lower income group which is 65% of total of people doing part time job. Only a smaller amount of higher income group did part time job that shares 6.7%

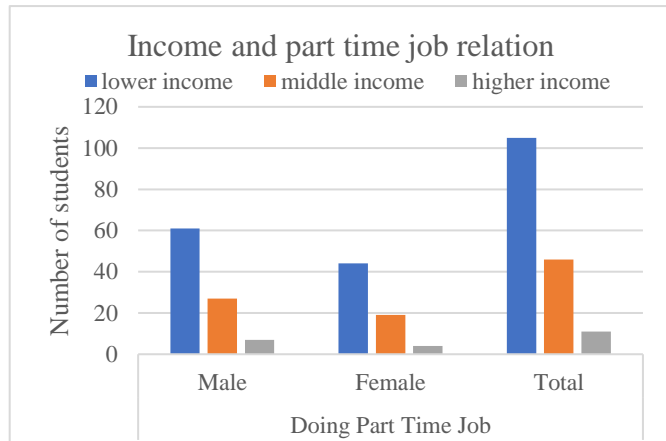


Figure 21: Income and part time job (online survey, 2021)

which is only 34% of that category. 46 students among 100 of middle-class group did part time job that is only 27% of those who had part time job, means the number of students of middle-income group who did part time job, is less than half of the lower income group students. So, in total, people from lower income group did part time job more. The more the monthly household income increases, the more the tendency of doing this activity decreases [figure21].

## 8.3 Relationship Between Earning Members of Their Family and Part Time Job Activity:

The graph shows both of the 2 respondents who had 0 earning member, did part time job (The survey says that only two respondents had 0 earning member in their family). It means, though it seems that the 1<sup>st</sup>

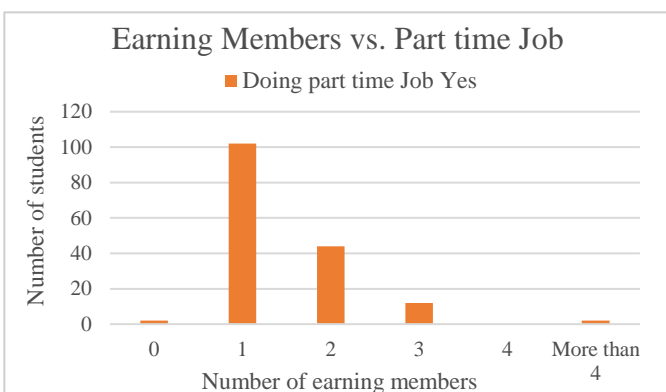


Figure 22: Earning member and part time job (online survey, 2021)

category had lowest tendency of doing so, 100% of them were actually engaged in part time job. 38% of those who had 1 earning member only in their family shared 2<sup>nd</sup> largest share. The more earning member increased, the more this tendency lessened [figure22].

## 8.4 Relationship Between Number of Family Members and Students' Part Time Job Activity:

The students who had 4 to 6 family members in their family used to engaged in this activity more than others. Besides, number of students having 4 to 6 family members is higher

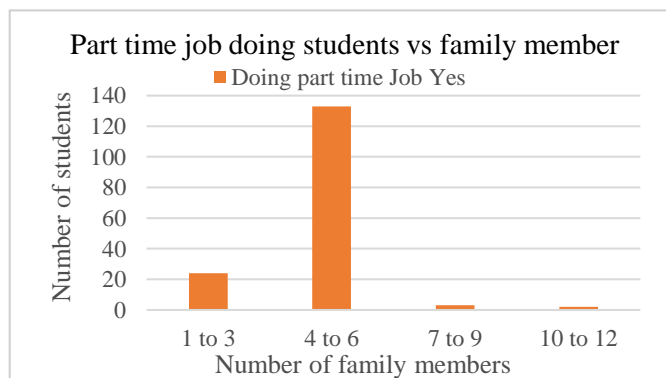


Figure 23: Family member and part time job (online survey, 2021)

than other categories that might influenced the result too. Students having 7 to 12 family members usually had more earning members that might be a reason why students from those family had a lower tendency of doing so. Besides, 45% students did this activity who had 1 to 3 family members that shares only 14% of the students who did part time job [figure23].

#### 8.5 Activity Covering Average Hours in A Day During Non-Lockdown Period (Male and Female):

The following graph has combined the activities that a male and female did on an average during non-lockdown period. A male or a female, both of them spent a larger portion behind sleeping in a day. Next comes other activities. Here other activities include any activities than the mentioned 7 activities. A male slept less than the time he spent behind other activity during this period. But for a mail, the scenario is opposite. Besides, the time that a male spent behind these two activates is smaller than the time a female spent in a day. A male spent 2.9 hours of his everyday behind online activities that was 2.6 hours/day for a female. For online work, the spending time of a male is higher than then female. But female students helped more than male during this period. A female spent 1.5hours in a day behind this that was 16hours/day for a male student. Study rate was higher for female at this time. A female spent 2.3 hours of her day behind this activity that was 2hours/day for a male student. Though a

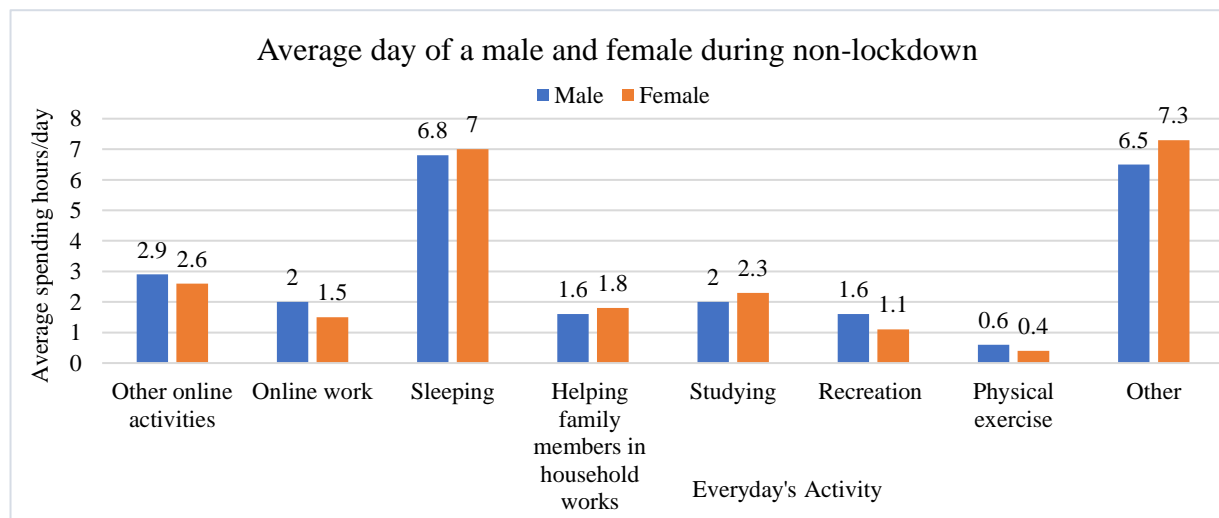


Figure 24: Average day of a male and female during non-lockdown (online survey, 2021)

female had a higher tendency of studying, a male spent more time behind recreation and physical exercise during this period. This is how a male and a female spent his/her regular day on an average during this period. Spending time on activities varied from gender to gender [figure24].

#### 8.6 Activity Covering Average Hours in A Day During Lockdown Period (Male and Female):

During this period, a male and a female respectively spent 7.7 hours and 8.3 hours of their day

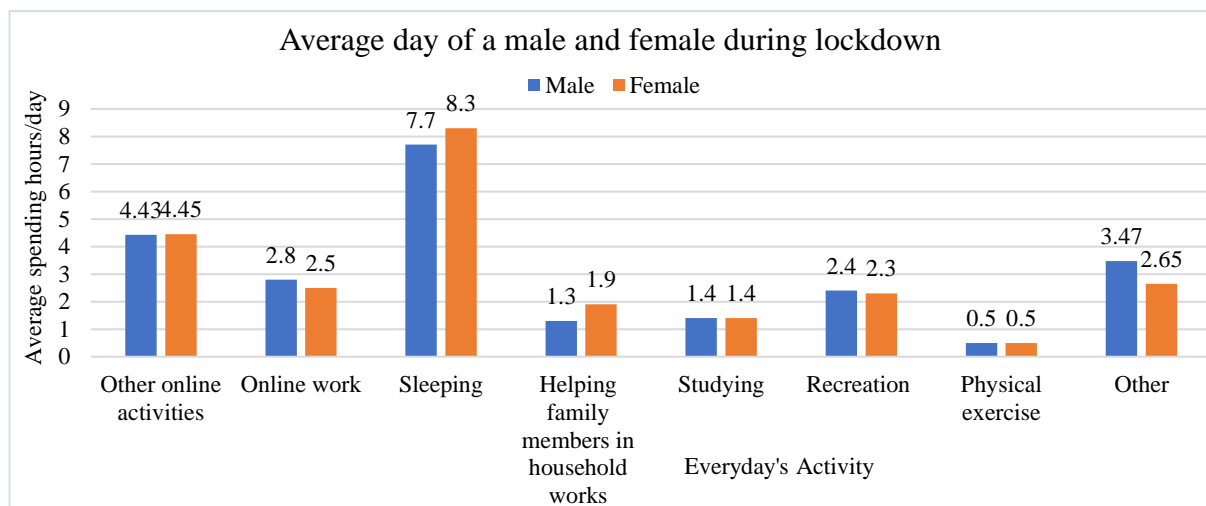


Figure 25: Average day of a male and female during lockdown (online survey, 2021)

behind sleeping. This activity took the largest share at this time where the 2<sup>nd</sup> largest share comes from other online activity that occupy 18% of their day for both groups. 5.8% of 24 hours of both groups was used for studying that was only 2% for physical exercise. A female spent 8% of her day behind helping her family that has a noticeable lower rate for a male. For the rest, both a male and a female spent almost same amount of his/her day on an average [figure24].

#### 8.7 Activity Covering Average Hours of a Student in A Day During Both Periods (In Total):

The following pie chart shows the overall day of a students behind many activities during lockdown and non-lockdown period. During non-lockdown period, a student spent 29% of his day that increased more and became 33% during lockdown. 18% of his day was spent behind any types of online activity at non-lockdown period that raised to 29% during lockdown, means a student spent more time on online during lockdown period. 7% and 6% of his day was spent

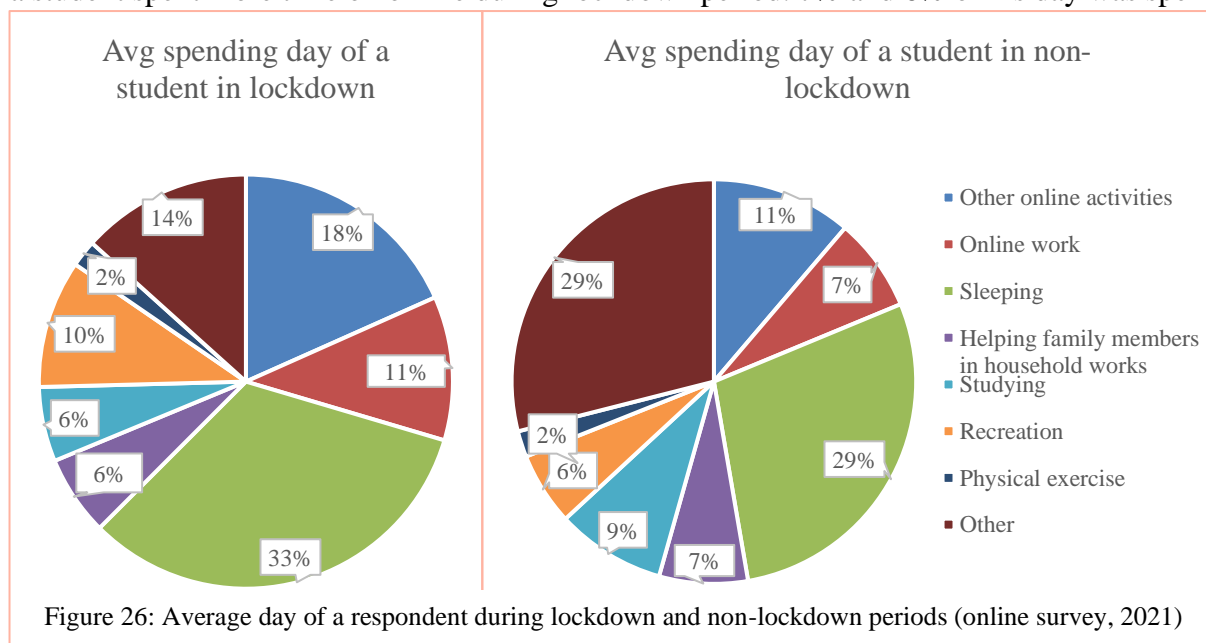


Figure 26: Average day of a respondent during lockdown and non-lockdown periods (online survey, 2021)

behind helping family during non-lockdown and lockdown period respectively. A student decreased 3% of his average spending time behind studying during lockdown that was 9% of 24 hours at non-lockdown period. 6% of his day was spent on recreation at non-lockdown period, but spent extra 4% of his day during lockdown, means during lockdown, spending time for recreation was 1 hour extra per day. The rest activities occupy rest of the 24 hours [figure26].

## **CHAPTER 9: MAJOR FINDINGS, RECOMMENDATION AND CONCLUSION——**

The study is done to analyze the activity pattern of a student during COVID-19 situation. Depending on the above activity patterns, the study has found out few noticeable features and so has recommended accordingly.

9.1 Major Findings and Recommendation: The activities followed few patterns during both periods. Depending on the patterns the major findings are as below.

*Approach 1: Sleeping pattern* - About 3% of them are seen to sleep less than 4 hours in a day. Though majority slept well during both periods, few students spent imbalanced time.

*Recommendation:* Students should sleep at least 7 to 9 hours per night. This is supported by sleep foundation too where they recommended that sleeping for young adult (18 to 25 years) should be as what is given above (Suni, 2021).

*Approach 2: Physical exercise* – A student spent 0.5 hours per day behind exercise on an average. Even, the rate is seen to be slightly lower at the time of girls.

*Recommendation:* The study recommends to get at least 150 minutes of moderate aerobic activity or 75 minutes of vigorous aerobic activity in a week. Besides, they can take physical exercise combining that is supported by Mayo Clinic too (Laskowski, 2019).

*Approach 3: Travelling and going outside during lockdown* – During lockdown period, 56.58% of the respondents went outside at least once in a week and 34.14% of them went on long distance travel at least once during that whole period.

*Recommendation:* Study recommends to ban all kinds of unnecessary travelling and going outside during lockdown. If anyone violates it, he must be brought under punishment.

*Approach 4: Online class* – Only 2 respondents responded that their university was not holding online classes, means 99.5% of them are seen to be used to online classes. So, they may now be familiar with the new education system for what submitting assignments, sharing notices, lectures or reading materials are easier and more organized than before.

*Recommendation:* The platform that are being used now for online classes and to share reading materials can be used too as a secondary helping hand when physical classes will be started.

*Approach 5: Online work* - 76-81% of the respondents are seen to be used to online work

*Recommendation:* Work from home can be practiced in future too if possible. It is economically beneficial and saves time. Then students will get extra time to develop themselves too.

*Approach 6: Network issue* – Students of city corporation area spent more time on online activity on an average. The more it went to lower urban area in area's hierarchy, the more this tendency was lessened. Better network in city corporation can be a reason behind such scenario.

*Recommendation:* Network problem should be omitted so that students from every area can do online activity. Otherwise, opportunity of doing any part time job or joining online classes will be hampered. Government may focus on it through organizing necessary policies.

*Approach 7: Part time job* – Students from lower income group or students having fewer earning members in their family had higher tendency of doing part time job. As doing tuition was their 1<sup>st</sup> priority, they had to go outside if it was not online based tuition.

*Recommendation:* Funding from university or government can be ensured for lower income group so that they have not to go outside during this pandemic to earn money. Students may engage themselves in doing online tuition, outsourcing or other work from home type jobs.

*Approach 8: Going outside of higher income group* – Students from higher income group are seen to go outside to eat at any restaurant, meet friends and do shopping mainly.

*Recommendation:* Study suggest that authority should ensure that such people may do online shopping instead of going outside, they may order foods on online as it has been enough familiar now-a-days.

*Approach 9: Online classes and exam* – Few universities are seen not to start online classes and online examinations yet.

*Recommendation:* Online classes should be started in all universities, otherwise their students will be lagged behind. Authority should give more emphasize on taking decisions whether they will take online exam or not as online exam is often seen to be unfair and many students have not proper network availability in their area.

*Approach10: Holding this study* – The study focuses only on the activity pattern of public universities' undergrad students.

*Recommendation:* Further study on this topic or related topic is encouraged

9.2 Conclusion: The study shows the overall activity pattern of a public university student in Bangladesh. The activities that a student does regularly, or even weekly varied from person to person and lockdown to non-lockdown period. Many factors might work behind bringing such changes. Perhaps, the new hygiene pattern, travel pattern, the quarantine time and others ultimately brought those changes in their daily-to-daily life's activity pattern. But the objective was to analyze the activities of the students during COVID-19. Using necessary graphs, charts, frequency table and estimators, the analysis has been done. Analyzing the activity patterns, it is seen that students spent a larger portion of his day behind sleeping. The students who slept less, had a higher tendency of using phone, watching TV or playing games or spending more time on online during both periods. Moreover, a new type of education system is being practiced that might influence other activities too. Maximum universities are seen to take online classes for what a student naturally had to stay on online more. Majority of them studied on an average 2 to 3 hours per day. Both groups had a tendency of doing recreation-based activities more during the lock-down period. The study shows that during lockdown, many universities kept their classes off, this might be a reason behind the above-mentioned scenario. Besides, as many of them studied less and few of them used to sleep less, those students are seen to get extra time for doing recreational activities. Though a student spent less time behind sleeping or studying, he had a good tendency of doing tuitions or other part time jobs. Other part time jobs, like- outsourcing or online business, were less practiced than tuition as it was their 1<sup>st</sup> choice. On an average, a male student spent more time behind doing part time job. Among male, a noticeable portion was engaged in outsourcing. Few girls did business too. Student from the lower income group had higher tendency of doing part time job. Besides, students who had no or only 1 earning members in their family, tended to do part time job more. Besides, the students who had 4 to 6 family members are seen to be engaged in this activity more than others. The number of respondents of this category was higher than other categories that might influence the result to some extent. Moreover, it is seen that student having more than 7 family members, actually had more than one earning member. This can be a reason behind engaging in part time job less than the others.

During the both periods, activity pattern of physical exercise was almost same. Students are not interested in doing physical exercise that is really alarming. As they do not have to walk or do many physical activities like before during corona, doing physical exercise is more demandable now to keep them in good health. Besides, traveling behavior has been fluctuated a lot during the two periods and gender to gender. During non-lockdown, many students used

to go on long distance travelling that lowered its tendency drastically during lockdown-period. Perhaps, the restriction of the government or the worse situation of COVID-19 worked as factor behind such scenario. But it is also noticed that, few of them went on long distance travel even during the lock-down period. Some of them went more than 7 times in total at this period. The authority should bring this under their consideration as such behavior pattern may work as fuel behind increasing corona cases in Bangladesh. If they will do it further without any valid reason, they should be brought under punishment.

The behavior pattern of going outside on an average day varied too. During non-lockdown period, the major reason behind going outside was meeting friends or eating. But during lockdown, any emergency case took the maximum share, for example – doing any essential shopping or any emergency necessity of medical services. Though lower income group used to go outside mainly because of doing their part time jobs, for higher and middle-income groups, it was eating and shopping.

Because of time and other constraints, few data could not be collected, as per could not be analyzed. The study suggests further research on this topic or related topic that will be helpful in near future. The study can be done by changing its operational definition of population or activities.

Analyzing all these activity patterns, the study has recommended few guidelines that will be helpful for further research. The government may get some guidelines and necessary information if they will decide to make any policy for the university students because of the ‘new-normal’ condition. Besides, the study also suggest that government or other organization should take necessary policy making programs in order to ensure a quality time of the students as COVID-19 seems not to disappear suddenly. Moreover, the results of the study may help design and target interventions aimed at increasing physical activity and reducing unhealthy levels of sedentary time associated with Pandemic mitigation efforts

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# APPENDIXES

## A: Final Co-ordination Schema

Objective	Research Query	Complex Variable/ Parameter	Simple Variable	Data Type	Level of Measurement	Data Collection Method	Data Collection Technique
1) To identify the general activities of the university students of Bangladesh during the non-lock down period due to enforced closer of universities	Who are the university students?	Student profile	Age	Quantitative	Interval	Primary	Questionnaire survey
			Gender	Qualitative	Nominal	Primary	
			Religion	Qualitative	Nominal	Primary	
			University(private/public)	Qualitative	Nominal	Primary	
			Level/ Term/ Year	Qualitative	Nominal	Primary	
			Dwelling location	Qualitative	Nominal	Primary	
	What are the daily activities of the university students during this period?	Daily activities	Sleeping pattern	Quantitative	Interval	Primary	Questionnaire survey
				Qualitative	Ordinal	Primary	
			Eating pattern	Quantitative	Interval	Primary	
				Qualitative	Ordinal	Primary	
			Studying pattern	Quantitative	Ratio	Primary	
			Religious activity	Quantitative	Ratio	Primary	
			Browsing phone	Quantitative	Ratio	Primary	
			Exercise/Meditation	Quantitative	Ratio	Primary	
			Staying outside	Quantitative	Ratio	Primary	
			Household chores	Quantitative	Ratio	Primary	
			Sedentary	Quantitative	Ratio	Primary	
			Others	Qualitative	Nominal	Primary	
Objective	Research Query	Complex Variable/ Parameter	Simple Variable	Data Type	Level of Measurement	Data Collection Method	Data Collection Technique
	How do the university students go on with their university classes during this period?	Online classes	Online classes (holding/ not holding)	Qualitative	Nominal	Primary	FGD/ Questionnaire
			Online Class (Schedule)	Quantitative	Interval	Primary	
			Assignment/ Lab	Qualitative	Nominal	Primary	Questionnaire
			Monthly network expenses	Quantitative	Ratio	Primary	
			Source	Qualitative	Nominal	Primary	
			Finance	Qualitative	Ordinal	Primary	
	What are the daily recreational activities of the university students during this period?	Daily recreational activities	Indoor game	Quantitative	Ratio	Primary	Questionnaire
			Outdoor game	Quantitative	Ratio	Primary	
			Watching TV	Quantitative	Ratio	Primary	
			Cultural activities	Quantitative	Ratio	Primary	
			Others	Qualitative	Nominal	Primary	
	What are the occasional recreational activities of the university students during this period?	Occasional recreational activities	Family picnic/ Tour	Quantitative	Ratio	Primary	Questionnaire
			Visiting relatives/ friends	Quantitative	Ratio	Primary	
			Visiting Restaurant	Quantitative	Ratio	Primary	
			Ordering online food	Qualitative	Ordinal	Primary	
			Others	Qualitative	nominal	Primary	

Objective	Research Query	Complex Variable/Parameter	Simple Variable	Data Type	Level of Measurement	Data Collection Method	Data Collection Technique
	What are the occasional activities of the university students during this period?	Occasional activities	Shopping	Quantitative	Ratio	Primary	Questionnaire and FGD
			Charity/ Raising fund/relief program	Qualitative	Nominal	Primary	
			Working with org/ club	Qualitative	Nominal	Primary	
			Skill development/ Online course	Qualitative	Ordinal	Primary	
				Qualitative	Nominal	Primary	
			Event/ Competition	Qualitative	Nominal	Primary	
			Seminar/ Workshop	Qualitative	Nominal	Primary	
	What are the sources of income of the university students during this period?	Income source	Offline tuition	Quantitative	Ratio	Primary	Questionnaire
				Quantitative	Ratio	Primary	
			Online tuition	Quantitative	Ratio	Primary	
				Quantitative	Ratio	Primary	
			Part time job	Quantitative	Ratio	Primary	
	What about the hygiene and precautionary activities of the university students during this period?	Hygiene and precautionary activities	Online business	Quantitative	Ratio	Primary	Questionnaire
			Others	Qualitative	Nominal	Primary	
			Wearing mask	Qualitative	Ordinal	Primary	
			Hand sanitizing	Qualitative	Ordinal	Primary	
			Social distance	Qualitative	Ordinal	Primary	
			Consuming sanitized food	Qualitative	Ordinal	Primary	

Objective	Research Query	Complex Variable/Parameter	Simple Variable	Data Type	Level of Measurement	Data Collection Method	Data Collection Technique
2) To identify the general activities of the university students of Bangladesh during the enforced lock down due to COVID 19	What are the daily activities of the university students during this period?	Daily activities	Sleeping pattern	Quantitative	Interval	Primary	Questionnaire survey
				Qualitative	Ordinal	Primary	
			Eating pattern	Quantitative	Interval	Primary	
				Qualitative	Ordinal	Primary	
			Studying pattern	Quantitative	Ratio	Primary	
			Religious activity	Quantitative	Ratio	Primary	
			Browsing phone	Quantitative	Ratio	Primary	
			Exercise/Meditation	Quantitative	Ratio	Primary	
			Staying outside	Quantitative	Ratio	Primary	
			Household chores	Quantitative	Ratio	Primary	
			Sedentary	Quantitative	Ratio	Primary	
			Others	Qualitative	Nominal	Primary	

Objective	Research Query	Complex Variable/Parameter	Simple Variable	Data Type	Level of Measurement	Data Collection Method	Data Collection Technique
	How do the university students go on with their university classes during this period?	Online classes	Online classes (holding/ not holding)	Qualitative	Nominal	Primary	FGD/ Questionnaire
			Online Class (Schedule)	Quantitative	Interval	Primary	
			Assignment/ Lab	Qualitative	Nominal	Primary	Questionnaire
			Monthly network expenses	Quantitative	Ratio	Primary	
			Source	Qualitative	Nominal	Primary	
			Finance	Qualitative	Ordinal	Primary	
	What are the daily recreational activities of the university students during this period?	Daily recreational activities	Indoor game	Quantitative	Ratio	Primary	Questionnaire
			Outdoor game	Quantitative	Ratio	Primary	
			Watching TV	Quantitative	Ratio	Primary	
			Cultural activities	Quantitative	Ratio	Primary	
			Others	Qualitative	Nominal	Primary	
	What are the occasional recreational activities of the university students during this period?	Occasional recreational activities	Family picnic/ Tour	Quantitative	Ratio	Primary	Questionnaire
			Visiting relatives/ friends	Quantitative	Ratio	Primary	
			Visiting Restaurant	Quantitative	Ratio	Primary	
			Ordering online food	Qualitative	Ordinal	Primary	
			Others	Qualitative	nominal	Primary	

Objective	Research Query	Complex Variable/ Parameter	Simple Variable	Data Type	Level of Measurement	Data Collection Method	Data Collection Technique
	What are the occasional activities of the university students during this period?	Occasional activities	Shopping	Quantitative	Ratio	Primary	Questionnaire
			Charity/ Raising fund/relief program	Qualitative	Nominal	Primary	
			Working with org/ club	Qualitative	Nominal	Primary	
			Skill development/ Online course	Qualitative	Ordinal	Primary	Questionnaire and FGD
				Qualitative	Nominal	Primary	
			Event/ Competition	Qualitative	Nominal	Primary	
			Seminar/ Workshop	Qualitative	Nominal	Primary	
	What are the sources of income of the university students during this period?	Income source	Offline tuition	Quantitative	Ratio	Primary	Questionnaire
				Quantitative	Ratio	Primary	
			Online tuition	Quantitative	Ratio	Primary	
				Quantitative	Ratio	Primary	
			Part time job	Quantitative	Ratio	Primary	
			Online business	Quantitative	Ratio	Primary	
			Others	Qualitative	Nominal	Primary	
	What about the hygiene and precautionary activities of the university students during this period?	Hygiene and precautionary activities	Wearing mask	Qualitative	Ordinal	Primary	Questionnaire
			Hand sanitizing	Qualitative	Ordinal	Primary	
			Social distance	Qualitative	Ordinal	Primary	
			Consuming sanitized food	Qualitative	Ordinal	Primary	

Objective	Research Query	Complex Variable/ Parameter	Simple Variable	Data Type	Level of Measurement	Data Collection Method	Data Collection Technique
3) To find out the relationships (if any) between activities and socio-economic condition	What are the socio-economic condition of the family of the university students?	Family's socio-economic condition	Number of family members	Quantitative	Interval	Primary	Questionnaire
			Current location (family)	Qualitative	Nominal	Primary	
			Earning member	Quantitative	Ratio	Primary	
			Monthly household Income (during non lock down)	Quantitative	Ratio	Primary	
			Monthly household Income (during lock down)	Quantitative	Ratio	Primary	
			Job status (govt./non govt./both)	Qualitative	Nominal	Primary	
			Household cost changes	Qualitative	Ordinal	Primary	
	What are the scenario of getting social support during this periods?	Social support	Support from friends	Qualitative	Ordinal	Primary	Questionnaire
			Support from relatives	Qualitative	Ordinal	Primary	
			Support from neighbor	Qualitative	Ordinal	Primary	
	What are the scenario of getting economic support during this periods?	Economic support	Support from friends	Qualitative	Ordinal	Primary	Questionnaire
			Support from relatives	Qualitative	Ordinal	Primary	
			Support from neighbor	Qualitative	Ordinal	Primary	

Objective	Research Query	Complex Variable/ Parameter	Simple Variable	Data Type	Level of Measurement	Data Collection Method	Data Collection Technique
	What are the other socio-economic activities/ patterns of them during these two periods?	Others	Losing job	Qualitative	Nominal	Primary	Questionnaire
			Reducing salary	Qualitative	Ordinal	Primary	
			Basic needs	Qualitative	Ordinal	Primary	
			Pandemic awareness	Qualitative	Ordinal	Primary	
			Community safety	Qualitative	Ordinal	Primary	
			Residential condition	Qualitative	Nominal	Primary	
			Session jot	Quantitative	Ratio	Primary	
	How did the activities/ patterns change for affected students/families during these two periods? (only for those who were affected)	Affected student/family's activities	Online class	Qualitative	Nominal	Primary	Questionnaire
				Qualitative	Ordinal	Primary	
			Medical cost	Qualitative	Ordinal	Primary	
			Hospitalizing/death	Qualitative	Nominal	Primary	
			Support	Qualitative	Ordinal	Primary	
			Symptoms	Qualitative	Ordinal	Primary	



## B: Final Questionnaire



**BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF URBAN AND REGIONAL PLANNING**

Assalamualaikum/Adab. We are the Level-2, Term-1 students of Department of Urban and Regional Planning, Bangladesh University of Engineering and Technology (BUET). We are conducting a research on 'A Study on Activity Pattern of University Students during COVID-19 Pandemic in Bangladesh'. To fulfill objectives of our research we need to know about your activity pattern at the lockdown and non-lockdown period during the covid period. This research is designed solely for academic purpose and all your responses will remain confidential. We shall be extremely grateful if you agree to co-operate with us and give some of your time to answer few questions. We thank you in advance for your kind co-operation.

Questionnaire ID

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Date:

**Please put ✓ to the appropriate answer for the following questions except 1f and 1g**

**1. General Information (Consider your current condition for the questions)**

<p><b>a. Gender</b></p> <p>1 Male 2 Female 3 Others</p>	<p><b>b. You are Living in a</b></p> <p>1. City Corporation Area 2. Paurashava Area 3. Union Area</p>	<p><b>c. You are residing in</b></p> <p>1. House owned by family 2. Government quarter, 3. Dormitory 4. Rental house 5. University hostel 6. Others</p>
<p><b>d. Monthly Family income to the best of your knowledge</b></p> <p>1. Less than Tk 10,000 2. Tk 10001 – 20,000 3. Tk 20001 – 30,000 4. Tk 30,001 – 50,000 5. Tk 50,001 – 100,000 6. More than Tk. 100,000</p>	<p><b>e. Occupation of Household Head</b></p> <p>1. Government Service 2. Private Service 3. Business 4. Agriculture 5. Others Please mention</p> <p>-----</p>	<p><b>f. Number of Earning Member in the family</b></p> <p>_____</p>
<p><b>g. Number of Family Member</b></p> <p>_____</p>	<p><b>h. Has your Family affected by COVID 19</b></p> <p>1. Yes 2. No</p>	<p><b>i How your family is affected by COVID 19</b></p> <p>1. Loss of Income 2. Loss of Job 3. Increased Income 4. More Job Opportunity 5. Others Please mention</p> <p>-----</p>

## 2. Educational Information

<b>a. Name of Your Educational Institute</b> _____
<b>b. Fill any one of the following:</b> _____ Level _____ Term _____ Semester _____ Year _

## 3. Information on Online Class

<b>a. Did your university organize Online Class?</b> 1. Yes 2. No	<b>b. If you answer Yes</b> 1. When it Started _____ (Month and Year) 2. Was it held during complete Lockdown/ Shut Down 1 Yes 2 No 3. On Average Class was held 1. Less than 3 Hrs/ week 2. 3 – 8hrs/week 3. 8 – 15 hrs/ Week 4. 15-20 hrs/Week 5. More than 20hrs/Week
<b>c. Did your university organize Online Examination?</b> 1. Yes 2. No	

Government declared complete lockdown all over the country in between 27<sup>th</sup> March 2020 to 30<sup>th</sup> May 2020 and Shut down from 1<sup>st</sup> July 2021; For the other time period as Relaxed Lockdown. Consider 27<sup>th</sup> March 2020 to 30<sup>th</sup> May 2020 and Shut down from 1<sup>st</sup> July 2021 as Lock down period and the other time when the university is physically closed as non-lockdown period to answer the questions.

Activity		Lock Down Period	Non-Lockdown
Online Activity	Study (Other than Class) (on an average day)	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs
	Other online activity (including reading news, using social media, online entertainment, online gaming but excluding on line work (On an average day)	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs



Activity		Lock Down Period	Non-Lockdown
	Online Work 🗨	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs
Indoor Activity	Sleeping (On an average Day)	1) Less than 4 hrs 2) 4 to 8 hrs 3) 8 to 10 hrs 5) More than 10 hrs	1) Less than 4 hrs 2) 4 to 8 hrs 3) 8 to 10 hrs 5) More than 10 hrs
	Household Chore (On an average Day)	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs
	Spending time with family (On an average Day)	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs
	Study (On an average Day)	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs
	Recreation (Watching TV, indoor game, <del>spending time with Family Members</del> ) (On an average Day)	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs
	Physical Exercise (On an average Day)	1) Didn't spend, 2) Less than 1hr 3) 1 to 2 hrs 4) 2 to 3 hrs 5) More than 3 hrs	1) Didn't spend, 2) Less than 1hr 3) 1 to 2 hrs 4) 2 to 3 hrs 5) More than 3 hrs
Outdoor Activity	Number of times spending outside the residence per week (On an average Week)	1) Didn't go 2) Less than Two Times 3) 2-4 times 4) 5-7 Times 5) More than 7 times	1) Didn't go 2) Less than Two Times 3) 2-4 times 4) 5-7 Times 5) More than 7 times
	Reasons for going outside	1) Eating 2) Essential Shopping (for example day to day shopping)	1) Eating 2) Essential Shopping (for example day to day shopping) 3) Tuition,

Activity		Lock Down Period	Non-Lockdown
		3) Tuition, 4) Meeting friends, 5) Medical emergency 6) Outdoor Games 7) Others (Please Mention)	4) Meeting friends, 5) Medical emergency, 6) Outdoor Games 7) Others (Please Mention) _____
	Hours spend outside (On an average week)	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs	1) Didn't spend, 2) Less than 1hr 3) 1 to 3 hrs 4) 3 to 6 hrs 5) More than 6 hrs
	Long distance Travel in this period	1) Didn't go 2) Less than Two Times 3) 2-4 times 4) 5-7 Times 5) More than 7 times	1) Didn't go 2) Less than Two Times 3) 2-4 times 4) 5-7 Times 5) More than 7 times
Miscellaneous	Part-time Job	1) Yes 2) No	1) Yes 2) No
	Type of Part time Job	1) Business 2) Tuition 3) Outsource 4) Private Job 5) Other	1) Business 2) Tuition 3) Outsource 4) Private Job 5) Other
	Frequency of visiting relatives/neighbors/friends per week	1) Didn't go 2) Less than Two Times 3) 2-4 times 4) 5-7 Times 5) More than 7 times	1) Didn't go 2) Less than Two Times 3) 2-4 times 4) 5-7 Times 5) More than 7 times

Thank you for your kind cooperation.

## C: Activity Surveyed

### 1) Online Activities:

- a) Doing online class
- b) Online work
- c) Other online activities

### 2) Indoor Activity:

- a) Studying
- b) Sleeping
- c) Helping in household chores
- d) Recreation activity
- e) Physical exercise

### 3) Outdoor Activity:

- a) Staying outside
- b) Long distance traveling

### 4) Miscellaneous Activity:

- a) Doing part time job
- b) Going to relative or friends or neighbors' house

## D: Sankey Diagrams

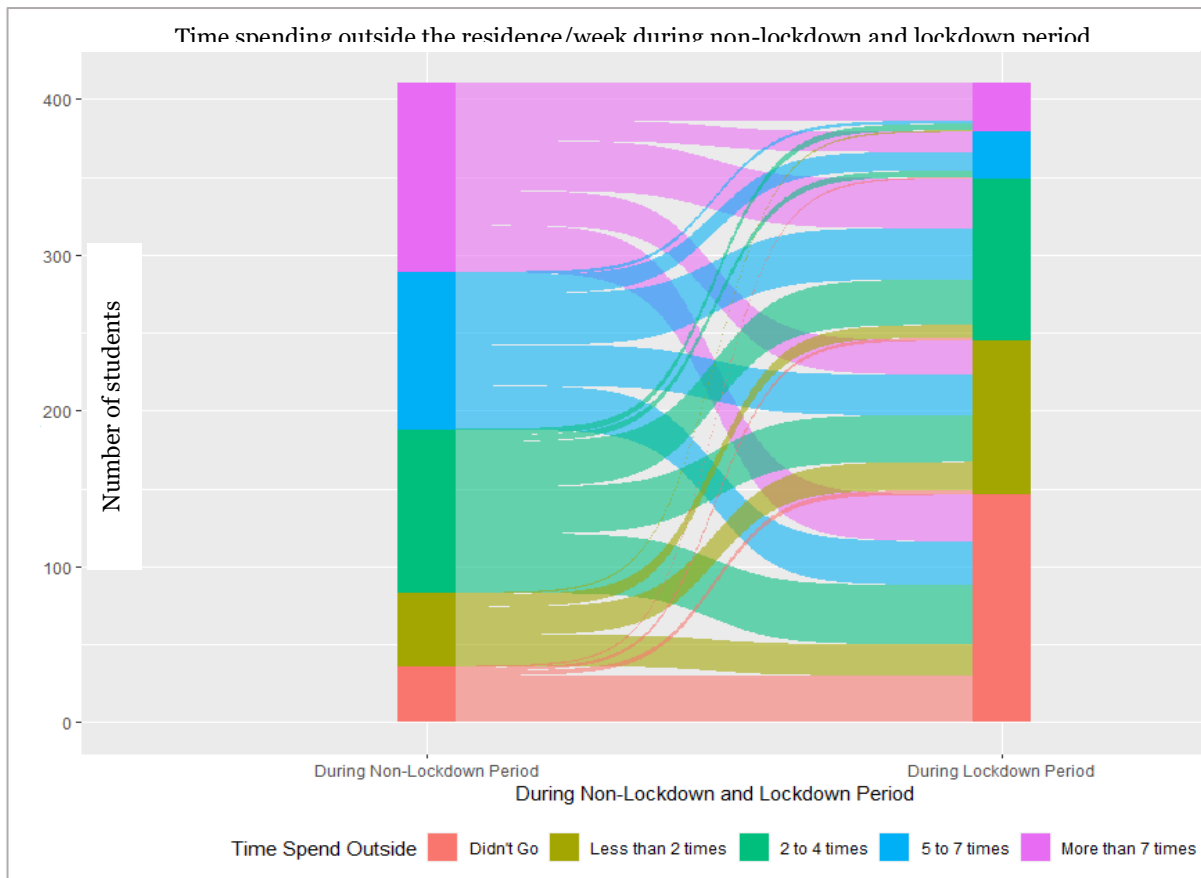


Figure a: Frequency of going outside (online survey, 2021)

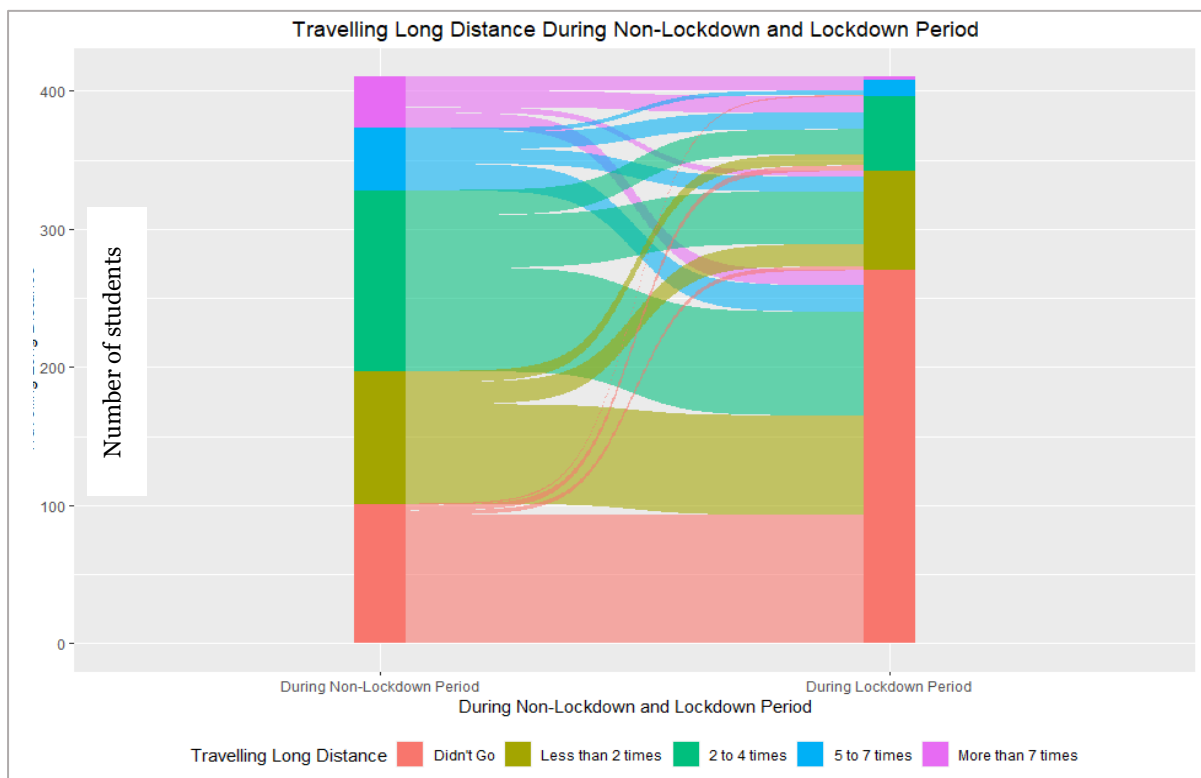


Figure b: Travelling long distance (online survey, 2021)

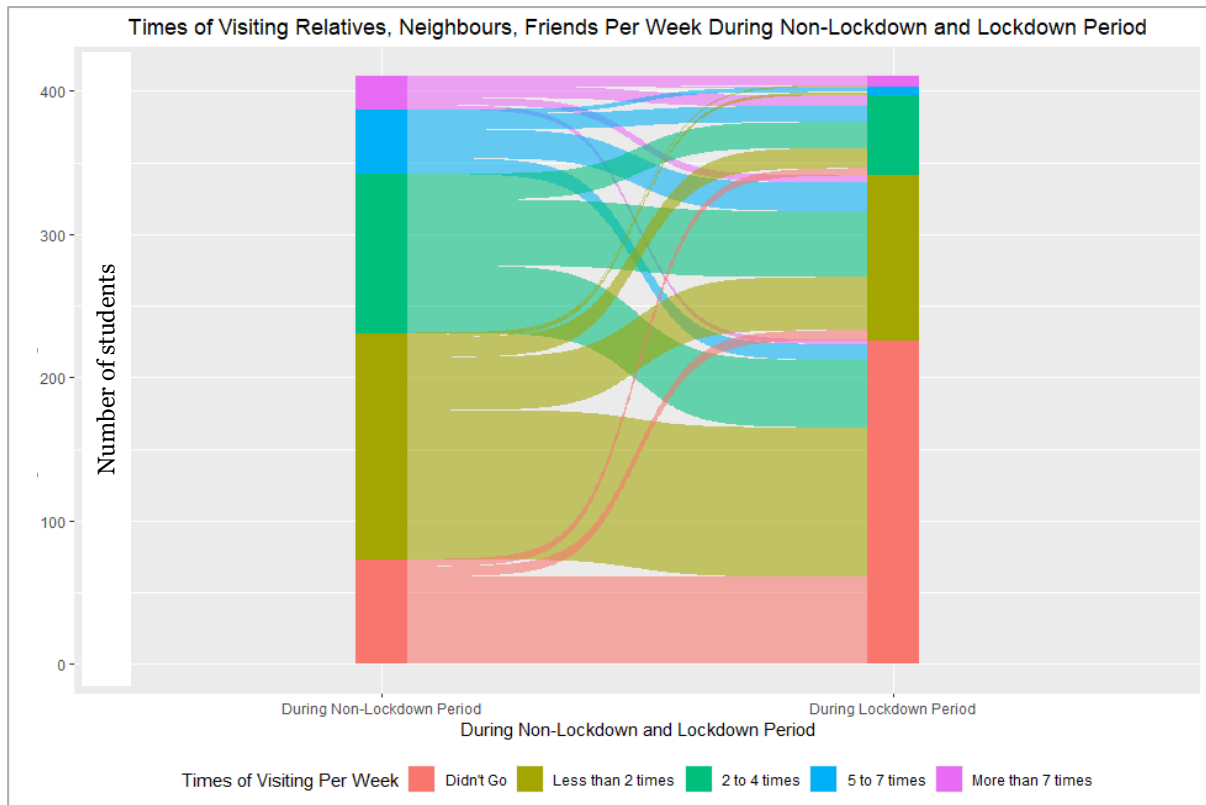


Figure c: Frequency of visiting relatives/neighbors/friends (online survey, 2021)

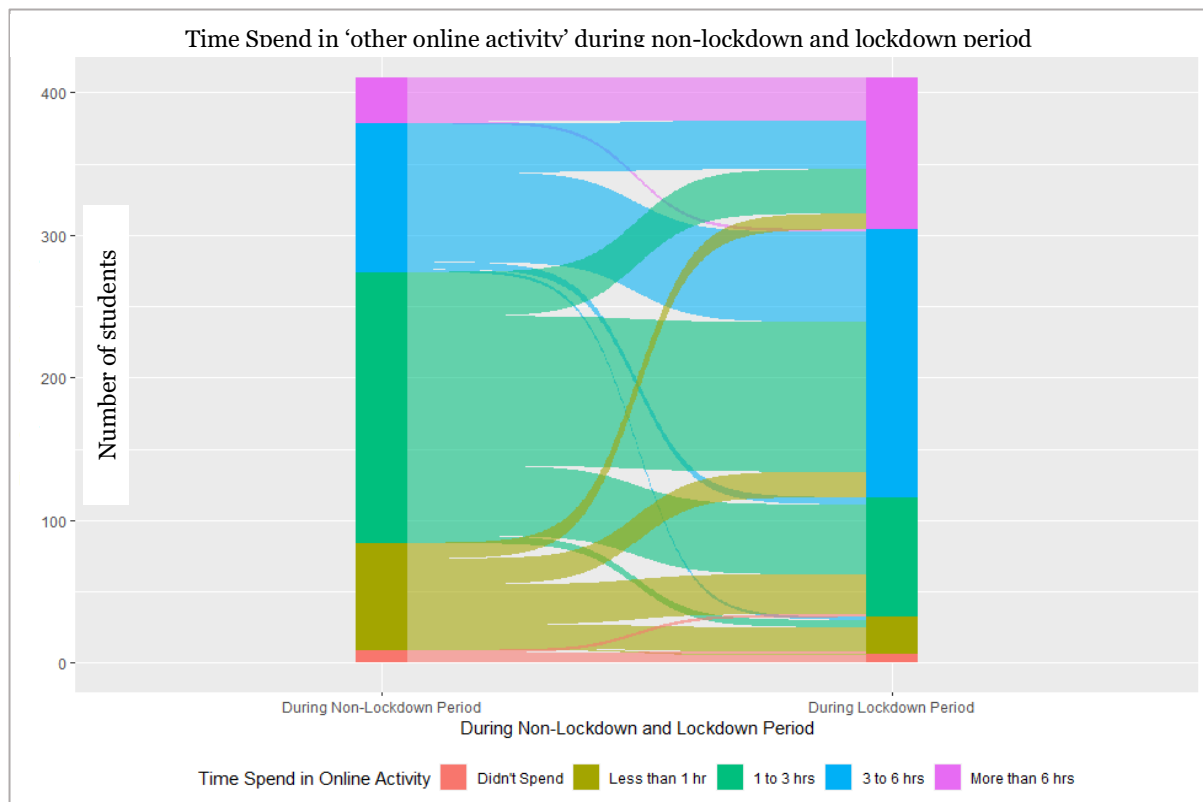


Figure d: Spending time behind other online activities (online survey, 2021)

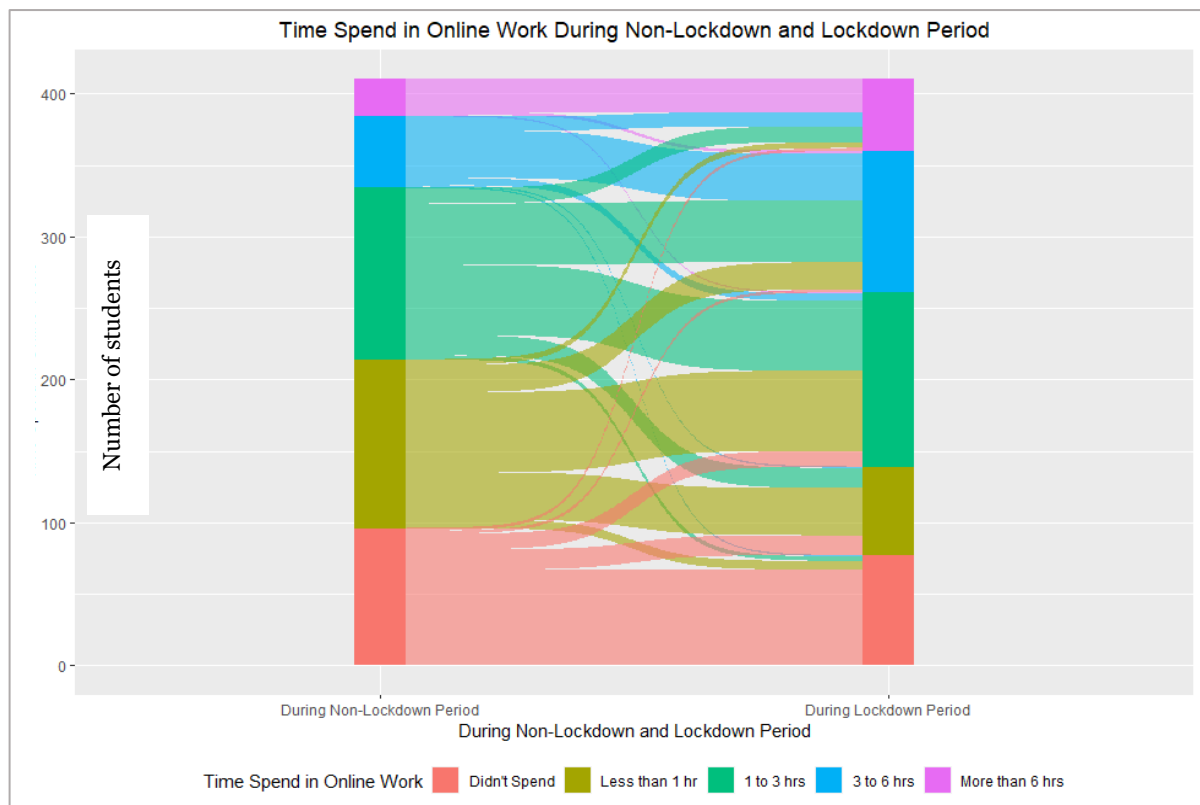


Figure e : Spending time behind online work (online survey, 2021)

## E: Mosaic Graphs

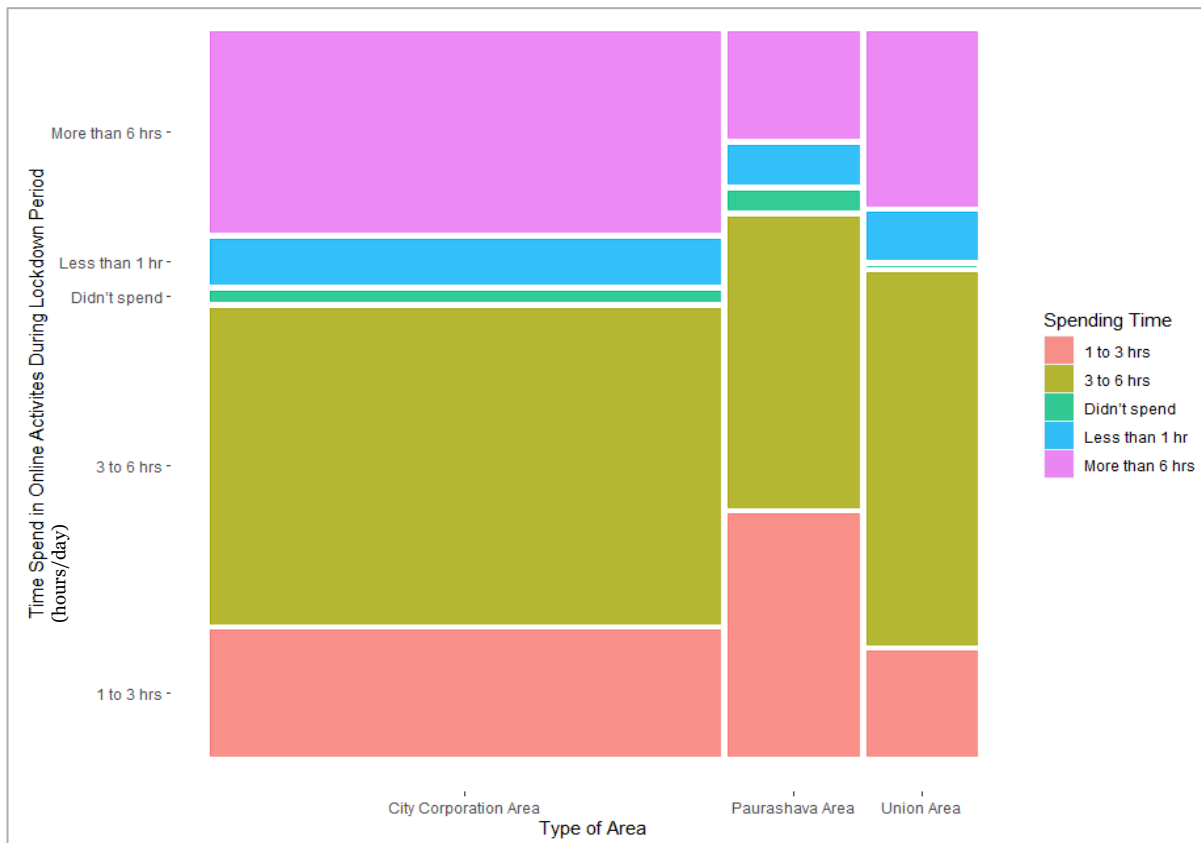


Figure f: Lockdown period's online activity and their residential area's relationship (online survey, 2021)

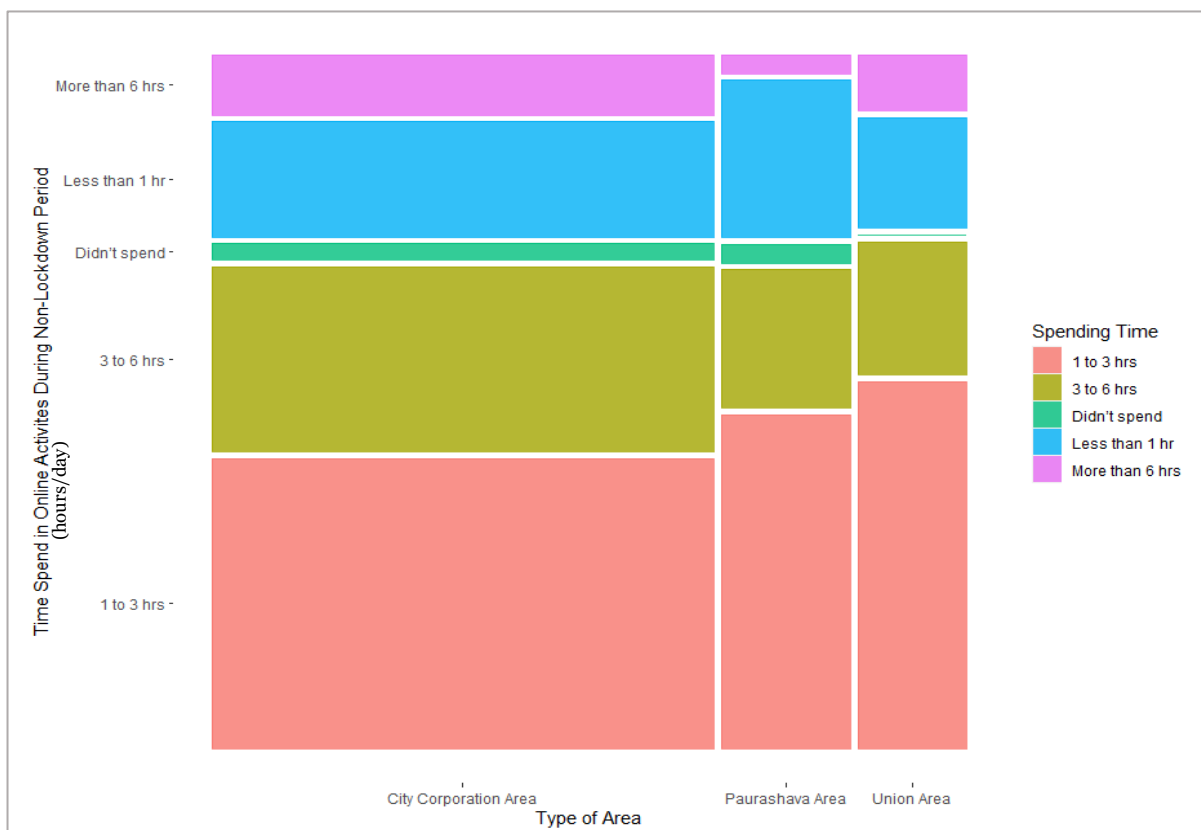


Figure g: non-lockdown period's online activity and their residential area's relationship (online survey, 2021)

## GLOSSARY

*Global Pandemic:* When an infectious disease has spread all over the world and has affected more people than an epidemic. A pandemic situation depends on number of people are infected, how virus creating severe illness etc.

*Health Protocol:* A plan that contains scientific and medical experiments, treatment, procedure.

*Trip number:* How many times a person travels or use vehicles

*Trip length:* Trip length means how much distance people travel when they go outside using vehicles.

*Modal shift:* It happens when one mode gives comparative benefit in a same market over another mode.

*Steep rise:* A quickly increase from low to high.

*Social distancing:* It means to help lessening spread of COVID-19, people have to stay home and far away from other peoples at least 3 feet.

*Microsoft excel:* A spreadsheet program that is used for data analysis by creating grids of text, numbers and formulas for calculations.

*Sample size calculator:* A software that helps to estimate how many people as a sample needs to do a research who are representative of target population.

*Confidence level:* The confidence level associated with a confidence interval states how much confidence we have that this interval contains the true population parameter.

*Confidence interval:* Confidence interval shows the possibility that a population parameter will fall between a set of values for a certain proportion of time.

*Margin of error:* It means that the percentage points survey results will not match from the real population value. If the survey determines that 70% students attend the exam at any situation with a 5% margin of error that ensures that either 65% or 75% will attend the exam.

*Descriptive analysis:* A summary statistics that describes features from a collection of information.

*Moderate Aerobic activity:* Activities like brisk walking, swimming and mowing the lawn are included in it.

*Vigorous Aerobic activity:* Activities like running, dancing is included in it.