

**A Narrative Review on
COVID-19 situation at various sectors in Bangladesh**

*A dissertation submitted in the partial fulfillment for the requirements of the degree of
Master of Public Health*



Abdul Karim

Student ID: 2120580

Date: January 2023

**A Narrative Review on
COVID-19 situation at various sectors in Bangladesh**

HSC 575: Thesis

Supervisor:

Dr. Kamran Ul Baset

Associate Professor

School of pharmacy and Public Health
Independent University of Bangladesh (IUB)

Phone: 01713-158455

Email: kamranspph@iub.edu.bd

Submitted by:

Abdul Karim

Student ID: 2120580



**School of Pharmacy and Public Health
Independent University, Bangladesh**

Acknowledgements

I would like to acknowledge my supervisor Dr. Kamran ul baset (Associate Professor) School of Pharmacy & Public Health (SPPH) for her kind help and cooperation from beginning to the end of this study. With pleasure I do express my thanks to Professor Dr. JMA Hannan, Dean, School of Pharmacy & Public Health (SPPH), Dr. Wasimul Bari, Department of Statistics, Biostatistics & Informatics, University of Dhaka, Bangladesh. I would like to thank all of my teachers and colleagues for their help and advice.

Finally, I say Alhamdulillah and thanks to almighty Allah to complete this thesis. I am also grateful to all my honorable faculty and adjunct faculty of the School of Pharmacy and Public Health, IUB for their pragmatic direction and cooperation.

Date: January 2023

| | |
|--|----|
| ABSTRACT..... | 5 |
| 1. INTRODUCTION..... | 6 |
| 2. OBJECTIVE..... | 8 |
| 3. METHODOLOGY..... | 9 |
| 4. RESULTS..... | 10 |
| 5. Discussion..... | 31 |
| 6. Conclusion and Recommendations..... | 33 |
| 7. Conclusion..... | 34 |
| 8. References..... | 34 |

ABSTRACT

The World Health Organization (WHO) declared COVID-19 a pandemic in March 2020 due to its rapid spread worldwide. Since then, efforts have been made to raise awareness and implement measures to prevent the spread of the disease. The objective of this study is to understand about COVID-19 situation at various health sectors in Bangladesh.

This study was conducted from 2020 to 2022. PubMed as well as Google scholar search engine is used for this Narrative study. This Study search is done by many keywords and research questions including: Covid-19, Forecasting, Medical Waste Management (MWM), online education system, Child Marriage, Public Health Challenge etc. Total number of this study papers are 11, including: Forecasting COVID-19 situation in Bangladesh, A review of the medical waste management system at Covid-19 situation in Bangladesh, Impact of COVID-19 pandemic on tourism, COVID-19 and child marriage in Bangladesh, COVID-19 and food supply in Bangladesh, Online education system in Bangladesh during COVID-19 pandemic. The data has been collected from internal various sectors of Bangladesh such as Healthcare, Online Education, Migrant Workers, Food Supply, Medical Waste Management, Education, Tourism etc.

Since the objective of this study is to understand about COVID-19 situation at various sectors the health in Bangladesh. So this study was done COVID-19 situation at various sectors the health in Bangladesh. The COVID-19 pandemic has had various impacts on different aspects of life in Bangladesh, including healthcare, waste management, tourism, child marriage, refugee support, migrant workers, food supply, online education, and domestic violence. The reviews emphasize the need for comprehensive strategies and interventions to address the challenges and mitigate the pandemic's impact on vulnerable communities. The government should invest in healthcare infrastructure, medical waste management, education, and resources to support survivors of domestic violence and provide financial assistance and repatriation for migrant workers. Additionally, the government should enforce laws and policies to prevent child marriage, protect the rights of children and refugees, and ensure the availability and accessibility of food for vulnerable communities. Through this study we have tried to bring together the Covid-19 situation in various health sectors in Bangladesh.

1. INTRODUCTION

The objective of this study is to understand about COVID-19 situation at various health sectors in Bangladesh. The articles discussed cover various aspects of the COVID-19 situation in Bangladesh, including forecasting, medical waste management, public health challenges, child marriage, Rohingya refugees, migrant workers, online education, domestic violence, COVID-19 and food supply etc. Authors have showed that recent information of COVID-19 confirmed cases, deaths, and recoveries to forecast the upcoming three months. The forecasting model of this research showed that there might be almost four-times growth in confirmed cases and deaths at the end of October if the trend of March to July lasts. Similarly, the forecast model reveals that there could be a five-fold increase in recoveries at the end of October [1].

This research brings out the important concerns on emerging challenges in Medical Waste Management (MWM) due to the Covid-19 pandemic in Bangladesh, as one of the densely populated developing countries in the world. The key legislative document on MWM of Bangladesh is the Medical Waste (Management and Processing) Rules, 2008. Due to the poor implementation of legislation and policy guidelines, the MWM has always been a concern even before the pandemic [2].

Tourism: The tourism industry has been severely impacted by the pandemic, with a decline in international travel and a decrease in domestic tourism as well. The government launched a campaign to promote local tourism, but it was yet to have a significant impact on the industry. The study aim is to measure the effect of the COVID-19 pandemic on the tourism industry in Bangladesh. This review utilized journals, historical records, newspaper articles, World Health Organization statistics, governmental data, and website materials on COVID-19 incidences in tourism [3]. Healthcare: The healthcare system in Bangladesh was strained by the surge in COVID-19 cases, with hospitals facing a shortage of beds, oxygen, and medical supplies. The government was working to increase the capacity of healthcare facilities and providing financial assistance to hospitals and medical staff. The purpose of this paper is to highlight the current pandemic situation of coronavirus disease 2019 (COVID-19) in Bangladesh, how the Government is managing this unprecedented condition and encountering these increasing public health challenges [4]. On the other hand the social burden of Bangladesh's already

prevalent child marriage problem has further flared up amid the ongoing COVID-19 pandemic [5]. Pandemic is now a global crisis and the Rohingya refugees in Bangladesh are in the most vulnerable situation [6]. Migrant workers play a significant role in the economy of Bangladesh, pumping approximately USD15 billion into the economy that directly contributes to the socio-economic development of Bangladesh every year [7]. This observational study has been planned to assess the scope and limitation of management strategy against COVID-19 patients in a medical college hospital of Bangladesh with available drugs in a real-life situation [8]. The purpose of this paper is to provide a general understanding of the possible impacts of COVID-19 on food supply in Bangladesh. The paper presents a brief summary of the global COVID-19 situation and the current food supply status concerning COVID-19 [9].

Education: Schools and universities have been closed since March 2020, and online learning was become the norm. The government launched a national online learning platform to provide education to students, but many students from low-income families have been unable to access it due to a lack of technology and connectivity. This paper also includes the discussion of digital education methods in Bangladesh, possibilities of digital education system and challenges for digital education system [10]. In Bangladesh, there is growing evidence that domestic violence acts as an opportunistic infection that thrives in the pandemic's situations [11].

It is clear that the COVID-19 pandemic has had a significant impact on various aspects of life in Bangladesh, including medical waste management, tourism, healthcare, child marriage, Rohingya refugees, migrant workers, food supply, education, and domestic violence. The pandemic has exposed existing flaws in the systems and policies of these sectors, highlighting the need for more effective and efficient measures to be put in place. The government has been working to address some of these challenges by providing financial assistance, increasing healthcare facilities' capacity, launching online learning platforms, and promoting local tourism. However, more needs to be done to ensure that vulnerable communities are not left behind, and the pandemic's long-term impacts are mitigated.

2. OBJECTIVE

The objective of this study is to understand about COVID-19 situation at various health sectors in Bangladesh.

3. METHODOLOGY

The study was conducted following the narrative review methodology. The papers were selected purposively. Both quantitative and qualitative papers were selected based on the study timeline, targeted population, location, and publication date. The overall process of the study followed multiple stages which have been discussed in this methodology section. Search Strategy Formulation Focusing on the study objective, multiple keywords were listed for literature searching. Most of the keywords were directly connected with COVID-19. This Study search is done by many keywords and research questions including: Covid-19, Forecasting, Medical Waste Management (MWM), online education system, Child Marriage, Public Health Challenge, Rohingya, Migrant Workers, Medical College Hospital, Covid-19 and food supply, Domestic violence etc.

The data has been collected from internal various sectors of Bangladesh such as Healthcare, Online Education, Migrant Workers, Food Supply, Medical Waste Management, Education, Tourism, etc.

PubMed as well as Google scholar search engine is used for this Narrative study. Process of information management of this study are Microsoft Excel 2013, Mendeley. The management of COVID-19 data in Bangladesh carried out by the Directorate General of Health Services (DGHS), which is the main government agency responsible for public health in the country. This study is done on 11 papers of 55 research papers including: Forecasting COVID-19 situation in Bangladesh, A review of the medical waste management system at Covid-19 situation in Bangladesh, Impact of COVID-19 pandemic on tourism, The COVID-19 pandemic and the public health challenges in Bangladesh, COVID-19 and child marriage in Bangladesh, COVID-19 pandemic and Rohingya refugees in Bangladesh, COVID-19's impacts on migrant workers from Bangladesh, Treatment of COVID-19 Patients at a Medical College Hospital in Bangladesh, COVID-19 and food supply in Bangladesh, Online education system in Bangladesh during COVID-19 pandemic and Impact of the COVID-19 pandemic on domestic violence in Bangladesh. This study was conducted from 2020 to 2022.

4. RESULTS

This results section presents the outcomes of the narrative review conducted on 11 selected papers. As per the analysis plan outlined in the methodology section, this section provides a compilation of the findings from these papers. It consists of four tables with subheads that explain the selected papers in detail.

Table 1: This table presents basic information of the reviewed publications including the study references, study title, authors and year of publications, journal name, search engine and link of the article.

Table 2: This table describes Methodology of the selected publications including: study references, study locations, target population, study design, sampling and sample sizes, type of statistical analysis and ethical clearance.

Table 3: This table presents the Major findings from the reviewed publications includes information on the Study reference, major findings and summary. It provides a systematic approach to summarizing the findings of the papers.

Table 4: This table outlines the strengths and limitations of the selected papers. In this section we will discuss the strength as well as limitations of 11 study papers the COVID-19 situation in Bangladesh.

Overall these 4 tables' details explanations showed in below.

Basic information of the reviewed publications:

In this section there are 7 subheads of 11 final papers these are study references, study titles, authors, and year of publications, journal names, search engines and link of articles. Year of publications are 2020 to 2022. This table is also include 11 journal names, search engine, link of the article.

Table 1: Basic information of the reviewed publications

| Study references | Study title | Authors | Year of publications | Journal name (volume) | Search engine | Link of the article |
|---|--|---|----------------------|---|----------------|---|
| Paper 1- Nesa, Mossamet Kamrun, Md Rashed Babu, and Mohammad Tareq Mamun Khan, 2022 | Forecasting COVID-19 situation in Bangladesh | Nesa, M.K., Babu, M.R. and Khan, M.T.M., 2022 | 2022 | Biosaf Health. 2022 Feb; 4(1):6-10. | Pubmed | https://pubmed.ncbi.nlm.nih.gov/34977530/ |
| Paper 2 - Barua, U. and Hossain, D., 2021 | A review of the medical waste management system at Covid-19 situation in Bangladesh. | Barua, U. and Hossain, D. | 2021 | J Mater Cycles Waste Manag 2021; 23(6):2087-2100. | Google Scholar | https://pubmed.ncbi.nlm.nih.gov/35194404/ |
| Paper 3 - Kumar, S. and Nafi, S.M., 2020 | Impact of COVID-19 pandemic on tourism: perceptions from Bangladesh | Kumar, S. and Nafi, S.M | 2020 | SSRN 3632798. | Google Scholar | https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3632798 |
| Paper 4 - Haque, A., 2020 | The COVID-19 pandemic and the public health challenges in | Haque, A | 2020 | <i>Journal of Health Research</i> | Google Scholar | https://www.emerald.com/insight/content/doi/10.1108/JHR-07-2020-0279/full/html |

| | | | | | | |
|---|---|----------------------------|------|--|----------------|---|
| | Bangladesh: a commentary | | | | | |
| Paper 5 - Hossain, M.J., Soma, 2021 | COVID-19 and child marriage in Bangladesh: emergency call to action | Hossain, M.J., Soma | 2021 | <i>BMJ paediatrics open</i> , 5(1) | Google Scholar | https://pubmed.ncbi.nlm.nih.gov/34841091/ |
| Paper 6 - Banik, R., Rahman, M., Hossai, 2020 | COVID-19 pandemic and Rohingya refugees in Bangladesh: What are the major concerns? | Banik, R., Rahman, | 2020 | <i>Global Public Health</i> , 15(10), pp.1578-1581 | Pubmed | https://pubmed.ncbi.nlm.nih.gov/32816647/ |
| Paper 7 - Karim, M.R., Islam, 2020 | COVID-19's impacts on migrant workers from Bangladesh: In search of policy intervention | Karim, M.R., Islam | 2020 | <i>World Development</i> , 136, p.105123 | Google Scholar | https://www.sciencedirect.com/science/article/pii/S0305750X20302503 |
| Paper 8 - Bhuyan, M. and Khan, M.S.I., 2020 | Treatment of COVID-19 Patients at a Medical College Hospital in Bangladesh | Bhuyan, M. and Khan, M.S.I | 2020 | <i>Euroasian journal of hepatogastroenterology</i> , 10(1), p.27 | Google Scholar | https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7376594/ |
| Paper 9 - Zabir, A.A., Mahmud, 2020 | COVID-19 and food supply in Bangladesh | Zabir, A.A | 2020 | <i>South Asian Journal of Social Studies and Economics</i> , 10(1), pp.15-23 | SSRN | https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3595967 |

| | | | | | | |
|---|--|-------------------------|------|---|----------------|---|
| Paper 10 - Khan, M.M., Rahman, S.T. and Islam, S.T.A., 2021 | Online education system in Bangladesh during COVID-19 pandemic | Khan, M.M., Rahman, S.T | 2021 | <i>Creative Education</i> , 12(2), pp.441-452 | Google Scholar | https://www.scirp.org/journal/paperinformation.aspx?paperid=107521 |
| Paper 11 - Sifat, R.I., 2020 | Impact of the COVID-19 pandemic on domestic violence in Bangladesh | Sifat, R.I | 2020 | <i>Asian journal of psychiatry</i> , 53, p.102393 | Google Scholar | https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7462560/ |

Methodology of the selected publications

In this section there are 7 subheads of 11 papers these are study references, study locations, target population, study design, sampling and sample sizes, type of statistical analysis and ethical clearance. Study locations of this narrative review is Bangladesh.

Table 2: Methodology of the selected publications

| Study references | Study location | Study design | Target population | Sampling and sample size / Remark | Type of statistical analysis / Remark | Ethical Clearance / Remark |
|---|-------------------------------|--------------------------|---|---|--|---------------------------------|
| Paper 1- Nesa, Mossamet Kamrun, Md Rashed Babu, and Mohammad Tareq Mamun Khan, 2022 | Bangladesh | ARIMA model | Researchers, policymakers. | Directorate General of Health Services. There was no sampling and sample size. | Auto-Regressive Integrated Moving Average (ARIMA) | There is no ethical clearance. |
| Paper 2 - Barua, U. and Hossain, D., 2021 | Bangladesh | Descriptive | Researchers, policymakers, healthcare professionals | No sampling was done in this study as it is a review of existing policy documents and guidelines related to medical waste management in Bangladesh. | No statistical analysis was conducted in this study as it is a review of existing policy documents and guidelines related to MWM | Ethical clearance was not exit. |
| Paper 3 - Kumar, S. and Nafi, S.M., 2020 | Bangladesh Tourism Industries | Secondary research study | healthcare professionals, tourism professionals | As the study is based on secondary data, there is no | No statistical analysis is performed in this research | Ethical clearance was not exit |

| | | | | specific sampling method used in this research. | | |
|---|------------|---|--|---|---|--------------------------------|
| Paper 4 - Haque, A., 2020 | Bangladesh | This paper is a viewpoint of the current COVID-19 pandemic situation in Bangladesh. | humanitarian organizations | There was no sampling and sample size. | No Statistical analysis in this paper. | Ethical clearance was not exit |
| Paper 5 - Hossain, M.J., Soma, 2021 | Bangladesh | No Study design | NGOs, social activists, humanitarian organizations | There was no sampling and sample size. | the study presents descriptive statistics, such as the percentage increase in child marriage prevalence due to the COVID-19 pandemic. | Ethical clearance was not exit |
| Paper 6 - Banik, R., Rahman, M., Hossai,2020 | Bangladesh | Quantitative | social activists, humanitarian organizations | There was no sampling and sample size. | No Statistical analysis in this paper. | Ethical clearance was not exit |
| Paper 7 - Karim, M.R., Islam, 2020 | Bangladesh | cross-sectional Study | Researchers, policymakers | Random sampling method | Descriptive statistics | Ethical clearance was not exit |

| | | | | | | |
|---|----------------------------|-----------------------------|---|--|--|--------------------------------|
| Paper 8 - Bhuyan, M. and Khan, M.S.I., 2020 | Kishoreganj, Bangladesh | Cohort design | study policymakers, healthcare professionals | The study includes all patients (N=33) who were positive for SARS-CoV-2 by PCR and attended the hospital with variable presenting symptoms. | No statistical analysis is performed in this research | Ethical clearance was not exit |
| Paper 9 - Zabir, A.A., Mahmud, 2020 | Bangladesh | Descriptive study | Researchers, policymakers, healthcare professionals | There was no sampling and sample size. | No Statistical analysis in this paper. | Ethical clearance was not exit |
| Paper 10 - Khan, M.M., Rahman, S.T. and Islam, S.T.A., 2021 | Bangladesh | Descriptive study | humanitarian organizations, educators was targeted population | There was no sampling and sample size. | No Statistical analysis in this paper. | Ethical clearance was not exit |
| Paper 11 - Sifat, R.I., 2020 | Bangladesh | Secondary research study | Policymakers, humanitarian organizations | There was no sampling and sample size. | No Statistical analysis in this paper. | Ethical clearance was not exit |

Major findings from the reviewed publications:

In this section there are 3 subheads of 11 final papers these are Study reference, major findings and summary. These 3 subheads details are showed in below.

Table 3: Major findings from the reviewed publications

| Study Reference | Major Findings | Summary |
|---|---|--|
| Paper 1- Nesa, Mossamet Kamrun, Md Rashed Babu, and Mohammad Tareq Mamun Khan, 2022 | <ul style="list-style-type: none"> • The findings of this research are that a short-term forecast is necessary to combat the COVID-19 pandemic in Bangladesh. Using recent data on confirmed cases, deaths, and recoveries, the forecasting model predicts a four-fold increase in confirmed cases and deaths by the end of October 2021 if the current trend continues. • There could be a five-fold increase in recoveries during the same period. The research used an ARIMA model with recent third wave data, which is essential for accurately forecasting the upcoming scenario. • This research emphasizes the need for policymakers to have an accurate understanding of the pandemic situation to determine their policies and strategies. | <p>The research conducted in Bangladesh highlights the importance of short-term forecasting in combating the COVID-19 pandemic. By analyzing data on confirmed cases, deaths, and recoveries using an ARIMA model, the study predicts a significant increase in confirmed cases and deaths by the end of October 2021 if the current trend continues. However, it also predicts a five-fold increase in recoveries during the same period.</p> <p>The findings underscore the importance of accurate data in developing effective policies and strategies to combat the pandemic. Policymakers must have a clear understanding of the situation to make informed decisions that will protect public health and reduce the spread of the virus.</p> <p>Overall, the study highlights the need for ongoing monitoring and analysis of COVID-19 data to provide policymakers with the information they need to respond effectively to the pandemic.</p> |

| | | |
|--|--|--|
| | | |
| <p>Paper 2 - Barua, U. and Hossain, D., 2021</p> | <ul style="list-style-type: none"> • The finding of this research is that the Covid-19 pandemic has exposed the poor implementation of Medical Waste Management (MWM) in Bangladesh, a densely populated developing country, even before the pandemic. • The key legislative document on MWM in Bangladesh, the Medical Waste (Management and Processing) Rules, 2008, does not address the process for accommodating emergencies like pandemics and the resultant tremendous load of medical waste. • To immediately tackle the MWM situation during the Covid-19 pandemic, several national guidelines have been published in Bangladesh, but they are not legally imposing and lack uniformity and elaboration complying with international standards. | <p>The Covid-19 pandemic has exposed the poor implementation of Medical Waste Management (MWM) in Bangladesh, which lacks adequate legislative frameworks to address emergencies like pandemics and lacks uniformity and elaboration complying with international standards. The problem of coordination among responsible authorities and reluctance from Healthcare Facility (HCF) owners and lack of knowledge of caregivers and the general population exacerbate the situation. The newly formulated Environmental and Social Management Framework (ESMF) framework addresses this concern, but its implementation is not evident. The study suggests that only carrying out a rapid Impact Assessment (IA) to analyze the gap is not enough, but implementation of mitigation measures accordingly is of prime importance. The research provides insights for policymakers to understand the gap in the MWM system in Bangladesh and take necessary actions to improve the situation by addressing the gaps accordingly. The study proposes that future research based on primary data collected from HCFs and WM sites would aid in better understanding of the implementation scenario and bring out a comprehensive picture of compliance through comparison with the documents formulated.</p> |

| | | |
|---|---|---|
| <p>Paper 3 - Kumar, S. and Nafi, S.M., 2020</p> | <ul style="list-style-type: none"> • The pandemic led to the closure of tourist spots, cancellation of flights, and suspension of on-arrival visas for tourists. As a result, the tourism industry has suffered significant financial losses, with an estimated loss of Tk 60 billion in 2020. Tour operators have lost close to Tk 15 billion, and approximately 0.3 million jobs are at risk in the tourism industry. • Cox's Bazar, known as the tourism capital of Bangladesh, and other major cities like Dhaka, Sylhet, Chittagong, and Khulna, which have developed tourism infrastructure, have been badly affected. • The pandemic has also affected the aviation industry, with Biman Bangladesh Airlines, the national flagship airline carrier of Bangladesh, experiencing a loss of USD 30 million. | <p>This study examines the impact of the COVID-19 pandemic on the tourism industry in Bangladesh. The research utilized secondary data collected from various sources, including journals, historical records, newspaper articles, World Health Organization statistics, governmental data, and website materials. The findings reveal that the pandemic has significantly affected the global travel and tourism industry, and Bangladesh is not an exception. Both inbound and outbound tourism have been adversely impacted, with international and domestic tourists cancelling bookings in Bangladesh, while outbound tourism activities have been banned. The aviation and hotel industries have been severely affected, leading to massive economic losses and employment cuts in the tourism sector. The study predicts a long-term adverse impact on the tourism industry in Bangladesh. To facilitate early economic recovery, the government has declared an incentive package for businesses. This review provides a theoretical model and literature on tourism to guide future studies in addressing the challenges facing the tourism industry due to the COVID-19 pandemic.</p> |
| <p>Paper 4 - Haque, A., 2020</p> | <ul style="list-style-type: none"> • The government has implemented various measures to prevent the spread of the virus, such as declaring hotspots, setting lockdowns, increasing awareness through | <p>The attitudes and knowledge of the public towards COVID-19 in Bangladesh are mixed, with some not fully understanding the severity of the situation or following recommended precautions due to misinformation and skepticism. The government has</p> |

| | | |
|--|--|--|
| | <p>social media and satellite TV channels, and encouraging private and community healthcare initiatives to increase hospital beds and COVID-19 treatment facilities. The deployment of defense forces and additional health workers and the increase in public holidays have also been implemented to reduce infections. However, despite these efforts, the number of infected individuals and deaths continue to rise, presenting significant challenges for the government and public healthcare professionals.</p> | <p>implemented measures to prevent the spread of the virus, and efforts have been made to increase awareness and promote public health measures, such as vaccination. However, rising infection and death rates indicate that there are still significant challenges that need to be addressed, and the government and healthcare professionals must continue working together to combat the spread of COVID-19 and increase public understanding and acceptance of recommended measures.</p> |
| <p>Paper 5 - Hossain, M.J., Soma, 2021</p> | <ul style="list-style-type: none"> • The report highlights concerns about the social burden of child marriage and emphasizes the need for concerted and integrated efforts from the government and local administrations to combat this crisis. It is crucial to address the underlying causes of child marriage, such as poverty, lack of education, and harmful social norms. • The findings that urgent action is necessary to protect the rights of children, especially girls, and ensure access to education, healthcare, and protection from early marriage. • The government and other stakeholders need to prioritize measures to address the impact of the pandemic on child marriage | <p>The COVID-19 pandemic has worsened the problem of child marriage in Bangladesh, with a reported increase of at least 13% in such cases due to school closures, financial difficulties, and social insecurity. The actual prevalence may be higher as many cases remain unreported. This social burden highlights the need for concerted efforts by the government and local administrations to address the underlying causes of child marriage, including poverty, lack of education, and harmful social norms. Urgent action is necessary to protect the rights of children, especially girls, and ensure access to education, healthcare, and protection from early marriage. The government and other stakeholders must prioritize measures to combat the impact of the pandemic on child marriage and implement strategies to prevent it in the future.</p> |

| | | |
|--|---|---|
| | and implement strategies to prevent child marriage in the future. | |
| Paper 6 - Banik, R., Rahman, M., Hossai,2020 | <ul style="list-style-type: none"> • It is essential to provide the Rohingya refugees with access to critical facilities such as isolation centers, protective equipment, and trained healthcare representatives to avoid a potential disaster. Additionally, education interventions are urgently needed to protect them from the deadly virus. • The findings indicate that the Rohingya refugees in Bangladesh are facing an extremely vulnerable situation due to the COVID-19 pandemic, and urgent action is required to provide them with access to critical resources and information. | <p>To avoid a potential disaster, it is essential to provide the Rohingya refugees with access to critical facilities such as isolation centers, protective equipment, and trained healthcare representatives. Additionally, education interventions are urgently needed to protect them from the deadly virus.</p> <p>Humanitarian organizations, in collaboration with the government of Bangladesh, must urgently scale up their efforts to provide these resources and information to the refugees to mitigate the impact of the pandemic. In summary, the major findings indicate that the Rohingya refugees in Bangladesh are facing an extremely vulnerable situation due to the COVID-19 pandemic, and urgent action is required to provide them with access to critical resources and information.</p> |
| Paper 7 - Karim, M.R., Islam, 2020 | <ul style="list-style-type: none"> • The finding is that migrant workers from Bangladesh play a significant role in the country's economy by contributing approximately USD 15 billion annually. • The situation has led to a financial crisis for the workers' families, and many have been | <p>Migrant workers from Bangladesh make a significant contribution to the country's economy by generating approximately USD 15 billion annually. However, due to the COVID-19 pandemic, these workers and their dependents are experiencing various socio-economic challenges such as unemployment, reduced</p> |

| | | |
|--|--|--|
| | <p>sent back to Bangladesh or are in fear of being sent back. To address these issues, the most urgent and important need is to provide financial security and social safety to the workers abroad and those who have returned to Bangladesh.</p> <ul style="list-style-type: none"> • The government of Bangladesh can take initiatives to provide short-term financial support to these workers and create a comprehensive plan with a detailed database of all migrant workers to create a need-based and skilled workforce as a long-term solution. Implementing these strategies can mitigate the impacts of COVID-19 at present and address migration-related problems in the future. | <p>working hours, isolation, poor quality of living, social discrimination, and mental pressure. This situation has resulted in a financial crisis for the workers' families, and many have been sent back to Bangladesh or are in fear of being sent back. To alleviate these challenges, providing financial security and social safety to the workers abroad and those who have returned to Bangladesh is the most urgent and crucial need. The government of Bangladesh can initiate short-term financial support programs for these workers and develop a comprehensive plan with a detailed database of all migrant workers to create a need-based and skilled workforce as a long-term solution.</p> <p>By implementing these strategies, the impacts of COVID-19 can be mitigated at present, and migration-related problems can be addressed in the future.</p> |
| <p>Paper 8 - Bhuyan, M. and Khan, M.S.I., 2020</p> | <ul style="list-style-type: none"> • The finding of the study that early diagnosis and hospital-based management of COVID-19 patients can lead to favorable outcomes. • The study acknowledges the limitations of a small sample size and lack of a control group due to the pandemic situation, which restricts comparative assessment of different treatments. | <p>The study suggests that early diagnosis and hospital-based management of COVID-19 patients can lead to positive outcomes, but it acknowledges limitations due to small sample size and lack of a control group. The study recommends further research with larger sample sizes and control groups to optimize COVID-19 management with different drug regimens. The study emphasizes that COVID-19 should not be a</p> |

| | | |
|--|--|--|
| | <ul style="list-style-type: none"> The study recommends further large cohort studies with bigger sample sizes and proper control groups to optimize COVID-19 management with different drug regimens. | <p>cause for panic, and public health measures and precautions can help manage the pandemic.</p> |
| <p>Paper 9 - Zabir, A.A., Mahmud, 2020</p> | <ul style="list-style-type: none"> The finding of this paper is that COVID-19 has had a significant impact on the food supply in Bangladesh, due to a combination of factors including the lockdown situation, labour shortages, and supply chain disruptions. This has led to a decrease in production and an imbalance in the food supply channels, with some products being forced to sell at a low price due to buyer shortages. While the government has taken policy measures to protect the agriculture sector and maintain sufficient food supply, the long-term prognosis of the pandemic remains unknown, and it may take years to overcome the economic shockwaves caused by COVID-19. | <p>The government of Bangladesh has taken policy measures to protect the agriculture sector and maintain sufficient food supply. The measures include providing subsidies to farmers, increasing support for seed and fertilizer distribution, and offering low-interest loans to farmers. The government has also taken steps to ensure the availability of transportation and storage facilities for agricultural products.</p> <p>However, the long-term prognosis of the pandemic remains unknown, and it may take years to overcome the economic shockwaves caused by COVID-19. In addition, the ongoing impact of climate change in the form of floods, droughts, and cyclones also poses a significant threat to the agricultural sector in Bangladesh. Therefore, it is crucial to continue monitoring the situation and taking necessary measures to ensure food security for the population.</p> |
| <p>Paper 10 - Khan, M.M., Rahman,</p> | <ul style="list-style-type: none"> The finding of the paper is that digital education has emerged as the most popular means of education during the COVID-19 pandemic due to the unprecedented | <p>The paper discusses the impact of the COVID-19 pandemic on education globally, with over 90% of enrolled students affected by some form of educational limitation imposed by institutions. The</p> |

| | | |
|---|--|--|
| <p>S.T. and Islam, S.T.A., 2021</p> | <p>disruption caused by the virus across the globe.</p> <ul style="list-style-type: none"> • The paper argues that while the short-term fight against the virus is focused on health, its long-term effects can only be addressed by a comprehensive and rapid digital education system. • The authors discuss the various digital education methods used in Bangladesh, the possibilities of a digital education system, and the challenges faced by such a system. • The paper emphasizes the importance of digital education in the context of the COVID-19 pandemic and highlights the need for a comprehensive and rapid system to address the long-term effects of the pandemic on education. | <p>paper argues that a comprehensive and rapid digital education system is necessary to prevent a lost generation due to the COVID-19 outbreak and to promote educational inclusion in an "epidemic-aware" world. The authors present a case study of the online education system in Bangladesh during the pandemic and investigate the current scenario of education in Bangladesh. They discuss the various digital education methods used in Bangladesh, the possibilities of a digital education system, and the challenges faced by such a system. Additionally, the paper examines the mental health of students during the COVID-19 pandemic in Bangladesh. Overall, the paper highlights the importance of digital education in the context of the COVID-19 pandemic and emphasizes the need for a comprehensive and rapid system to address the long-term effects of the pandemic on education.</p> |
| <p>Paper 11 - Sifat, R.I., 2020</p> | <ul style="list-style-type: none"> • The finding on domestic violence in Bangladesh highlights several issues, including dowry-related violence, child marriage, marital rape or violence, physical torture, verbal abuse, harassment, and humiliation. • Married women are often physically and mentally abused by their husbands, | <p>Domestic violence in Bangladesh is a serious issue, with a range of abuses occurring, including dowry-related violence, child marriage, marital rape or violence, physical torture, verbal abuse, harassment, and humiliation. Unfortunately, the COVID-19 pandemic has not reduced the number of incidents, with rapes and sexual assaults happening both inside and outside homes. Women are often physically and mentally abused by their husbands, husbands' families, and their own family members. Shockingly,</p> |

| | | |
|--|---|---|
| | <p>husbands' families, and their own family members.</p> <ul style="list-style-type: none"> • Victims of domestic violence are often sent back to their abusive husbands from their family homes, as it affects their family's reputation. To combat domestic violence, the government, NGOs, community-based organizations, voluntary organizations, and religious leaders must use various media and platforms to raise awareness. | <p>many women are murdered by their husbands or family members, and many cases go unreported. Victims are often sent back to their abusive husbands from their family homes, as it affects their family's reputation. To combat domestic violence, the government, NGOs, community-based organizations, voluntary organizations, and religious leaders must raise awareness through various media and platforms. Social media can be used as a forum to raise awareness, and law enforcement agencies need more tools to respond and take appropriate action. Emergency helpline numbers and websites should be introduced, and domestic violence services should be classified as "essential," with support workers classified as "key" workers. Free tele-counseling or video counseling services should be made available for mental health support.</p> |
|--|---|---|

Strength and limitations with Ethical Clearance of the articles

The COVID-19 pandemic has significantly affected various sectors in Bangladesh, including healthcare, economy, education, social life etc. In this section we will discuss the strength as well as limitations with ethical clearance of 11 study papers the COVID-19 situation in Bangladesh.

Table 4: Strength and limitations with Ethical Clearance of the articles

| SI No | Strength | Limitations with Ethical Clearance |
|----------|---|--|
| Paper1. | <ul style="list-style-type: none"> • Bangladesh has a strong public health surveillance system with a network of hospitals, clinics, and diagnostic laboratories across the country. • The government and non-governmental organizations have been actively engaged in raising awareness about COVID-19 prevention and control measures. • The country has implemented various measures, such as lockdowns, testing, tracing, and treatment, to control the spread of the virus. • Bangladesh has a relatively young population, which may be less susceptible to severe disease and death from COVID-19. | <ul style="list-style-type: none"> • Limited testing capacity and inadequate data collection and reporting systems may lead to underestimation of COVID-19 cases and deaths. • The country's healthcare system may be overwhelmed by a surge in COVID-19 cases, as it has limited resources and infrastructure. • The population density and overcrowding in urban areas may facilitate the rapid spread of the virus. • Limited access to healthcare services and inadequate provision of personal protective equipment (PPE) may increase the risk of healthcare workers' infection. <p>There was no ethical clearance exit in this study.</p> |
| Paper 2. | <ul style="list-style-type: none"> • The government has issued guidelines for the proper management of COVID-19 medical waste, and hospitals and clinics are required to follow these guidelines. | <ul style="list-style-type: none"> • There is a lack of awareness and training among healthcare workers regarding proper medical waste management practices. • The availability of PPE and other resources necessary for the safe handling of medical waste may be limited. |

| | | |
|----------|--|--|
| | <ul style="list-style-type: none"> • Bangladesh has a well-established waste management system, and several private companies are engaged in the collection, transportation, and disposal of medical waste. • The country has designated specific facilities for the treatment and disposal of COVID-19 medical waste. | <ul style="list-style-type: none"> • The country may face challenges in managing the large volume of medical waste generated during the pandemic. • The monitoring and enforcement of medical waste management regulations may be inadequate. <p>There was no ethical clearance exit in this study.</p> |
| Paper 3. | <ul style="list-style-type: none"> • The government has provided financial support to the tourism industry, including the waiver of taxes and fees and the introduction of low-interest loans. • The country's natural beauty and cultural heritage may attract domestic tourists, which could mitigate the decline in international tourism. • The government has implemented various measures, such as the mandatory use of face masks and social distancing, to ensure the safety of tourists and prevent the spread of the virus. | <ul style="list-style-type: none"> • The closure of international borders and the suspension of international flights have significantly reduced international tourism. • The country's tourism industry is heavily dependent on foreign tourists, and the decline in international tourism has had a severe economic impact. The pandemic has disrupted the tourism industry's supply chain, including the hospitality and transportation sectors. • The perception of Bangladesh as a high-risk destination for COVID-19 may discourage tourists from visiting the country. <p>There was no ethical clearance exit in this study.</p> |
| Paper 4. | <ul style="list-style-type: none"> • The Bangladeshi government has been proactive in implementing measures to control the spread of COVID-19. • The country has increased its capacity for testing and treatment, including setting up dedicated COVID-19 hospitals. • There has been good collaboration between the government and non-governmental organizations in the country to address the pandemic. | <ul style="list-style-type: none"> • The country's healthcare system has limited resources and inadequate infrastructure, which makes it challenging to manage the COVID-19 pandemic effectively. • The lack of awareness and misinformation about the virus among the public has made it difficult to enforce preventive measures such as wearing masks and social distancing. • Limited access to healthcare services in remote areas of the country has also made it difficult to monitor and control the spread of the virus. <p>There was no ethical clearance exit in this study.</p> |

| | | |
|----------|---|--|
| Paper 5. | <ul style="list-style-type: none"> • The Bangladeshi government has taken measures to raise awareness about the negative impacts of child marriage on girls and their families during the pandemic. • Non-governmental organizations have been working to provide support to girls who are at risk of child marriage during the pandemic. | <ul style="list-style-type: none"> • The economic impacts of the pandemic have increased the risk of child marriage as families face financial hardship. • School closures have also increased the risk of child marriage as girls are at home with fewer opportunities for education and social interaction. • The government's efforts to prevent child marriage have been hindered by limited resources and challenges in enforcing existing laws. <p>There was no ethical clearance exit in this study.</p> |
| Paper 6. | <ul style="list-style-type: none"> • The Bangladeshi government has provided shelter and humanitarian assistance to Rohingya refugees in the country during the pandemic. • Non-governmental organizations have been providing support to Rohingya refugees to help them access healthcare services and prevent the spread of the virus. | <ul style="list-style-type: none"> • The overcrowded living conditions in refugee camps have made it difficult to implement preventive measures such as social distancing. • The limited access to healthcare services in the camps has also made it challenging to manage the spread of the virus. • The economic impacts of the pandemic have made it difficult for Rohingya refugees to access essential services and meet their basic needs. <p>There was no ethical clearance exit in this study.</p> |
| Paper 7. | <ul style="list-style-type: none"> • The Bangladeshi government has taken steps to repatriate migrant workers who have lost their jobs due to the pandemic and provide them with financial support. | <ul style="list-style-type: none"> • The pandemic has led to a loss of jobs and income for many migrant workers from Bangladesh, who are often working in low-paying and insecure jobs. • The lack of access to healthcare and protective equipment has made migrant workers vulnerable to infection. The pandemic has also led to increased discrimination and xenophobia towards migrant workers in some countries. <p>There was no ethical clearance exit in this study.</p> |

| | | |
|-----------|--|---|
| Paper 8. | <ul style="list-style-type: none"> • Medical professionals in Bangladesh have been working tirelessly to treat COVID-19 patients and save lives. • The Bangladeshi government has provided support to hospitals and medical professionals to help them manage the pandemic. | <ul style="list-style-type: none"> • The country's healthcare system has limited resources and inadequate infrastructure, which makes it challenging to provide optimal care to COVID-19 patients. • The lack of personal protective equipment and other essential supplies has put medical professionals at risk of infection. The economic impacts of the pandemic have made it difficult for some patients to access healthcare services. <p>There was no ethical clearance exit in this study.</p> |
| Paper 9. | <ul style="list-style-type: none"> • Bangladesh is an agrarian country with a vast amount of arable land, which has helped to maintain the food supply chain during the pandemic. • The government has taken several measures to ensure food security for vulnerable groups, such as distributing food aid and subsidies. • The government has allowed the uninterrupted operation of the transportation and logistics sector, ensuring that food items can be transported across the country. • Local farmers and small-scale businesses have been encouraged and supported to increase production and supply of food items, which has helped to sustain the food supply chain. | <ul style="list-style-type: none"> • The pandemic has affected the overall production and supply chain, leading to higher prices of food items in the market. • Restrictions on movement have hindered the distribution of food items, especially in remote areas of the country. • The closure of restaurants and hotels has reduced the demand for certain types of food items, leading to a loss of income for those involved in the supply chain of these items. • The economic slowdown caused by the pandemic has resulted in a reduction in purchasing power for many people, which has made it difficult for them to afford basic food items. <p>There was no ethical clearance exit in this study.</p> |
| Paper 10. | <ul style="list-style-type: none"> • The government has taken several initiatives to provide online education to students, including the development of an e-learning platform and broadcasting lessons on television. | <ul style="list-style-type: none"> • A lack of infrastructure and resources, such as computers and internet connectivity, has hindered the ability of many students to access online education. • The quality of online education may not be the same as in-person education, as it may be difficult to maintain student engagement and provide interactive learning experiences. |

| | | |
|-----------|---|---|
| | <ul style="list-style-type: none"> • The use of technology has allowed for the continuation of education during the pandemic, reducing the disruption of students' academic progress. • Online education has provided opportunities for students in remote areas of the country to access education, which they may not have had otherwise. | <ul style="list-style-type: none"> • Many teachers may not have been adequately trained to teach online, which may affect the quality of education provided. • Online education may not be accessible to students with disabilities or those from marginalized communities who may not have equal access to technology. <p>There was no ethical clearance exit in this study.</p> |
| Paper 11. | <ul style="list-style-type: none"> • The government has taken measures to provide support to victims of domestic violence, including setting up hotlines and shelters for victims. • The pandemic has brought increased attention to the issue of domestic violence in Bangladesh, leading to increased awareness and advocacy efforts. | <ul style="list-style-type: none"> • The pandemic has led to an increase in incidents of domestic violence, as victims may be trapped with their abusers due to lockdown measures. • Many victims may be hesitant to seek help or report incidents of domestic violence due to fear of reprisals or lack of access to support services. • The economic slowdown caused by the pandemic may increase financial stress, which may exacerbate tensions and lead to an increase in incidents of domestic violence. The existing social and cultural norms in Bangladesh may make it difficult for victims to come forward and seek support or justice. <p>There was no ethical clearance exit in this study.</p> |

Key Summary

The COVID-19 pandemic has had a significant impact on various aspects of life in Bangladesh, including healthcare, education, tourism, and social issues such as child marriage and domestic violence. The country has faced challenges in managing medical waste, supporting migrant workers, ensuring food security, and providing online education to all students. Policymakers need to address these challenges

and take measures to strengthen the healthcare system, revive the tourism industry, and protect vulnerable populations such as refugees and women.

5. Discussion

The COVID-19 pandemic has affected many countries, including Bangladesh. It is essential to forecast the situation to prepare for the future. Forecasting techniques such as time series analysis and machine learning algorithms can be used to predict the number of COVID-19 cases in Bangladesh. These models can help policymakers make informed decisions about health policies, resource allocation, and lockdown measures. There is a need for accurate forecasting of the COVID-19 situation in Bangladesh, and several studies have attempted to model the spread of the disease. Additionally, the impact of COVID-19 on tourism in Bangladesh has been significant, with many businesses struggling due to reduced travel. The medical waste management system in Bangladesh has faced significant challenges during the COVID-19 pandemic, with limited resources and inadequate infrastructure. Review of the medical waste management system at COVID-19 situation in Bangladesh: Proper medical waste management is crucial during the COVID-19 pandemic to prevent the spread of the virus. In Bangladesh, there is a need for an efficient medical waste management system to handle the increased amount of waste generated by hospitals, quarantine centers, and testing facilities. The review of the medical waste management system can help identify the gaps and suggest improvements in the system. The COVID-19 pandemic has severely affected the tourism industry worldwide, and Bangladesh is no exception. The tourism industry has experienced a significant decline due to travel restrictions, quarantine measures, and fear of infection. The impact on the tourism industry has affected the livelihoods of many people, including hotel staff, tour guides, and small business owners. Understanding the perceptions of people in Bangladesh can help policymakers take appropriate measures to revive the tourism industry.

The COVID-19 pandemic has highlighted the public health challenges faced by Bangladesh, including limited healthcare infrastructure, inadequate health financing, and weak disease surveillance systems. This commentary provides an overview of the public health challenges and suggests measures to strengthen the healthcare system to better prepare for future pandemics. COVID-19 and child

marriage in Bangladesh: emergency call to action: The COVID-19 pandemic has led to an increase in child marriages in Bangladesh, as families struggle to cope with the economic impacts of the pandemic. Child marriages have detrimental effects on the health and well-being of young girls, including increased risk of domestic violence, early pregnancy, and limited educational opportunities. This article calls for urgent action to address the issue of child marriage in Bangladesh. The COVID-19 pandemic has highlighted the vulnerabilities of the Rohingya refugees living in Bangladesh. The overcrowded living conditions, limited access to healthcare, and lack of basic amenities put the refugees at high risk of contracting and spreading the virus. The article highlights the major concerns and calls for immediate action to protect the refugees from the pandemic. COVID-19's impacts on migrant workers from Bangladesh: The COVID-19 pandemic has severely affected the livelihoods of migrant workers from Bangladesh, who are employed in various countries around the world. The pandemic has resulted in loss of jobs, reduced remittances, and limited access to healthcare. The article emphasizes the need for policy interventions to support the migrant workers and their families during these difficult times.

Treatment of COVID-19 Patients at a Medical College Hospital in Bangladesh: This article provides an overview of the treatment of COVID-19 patients at a medical college hospital in Bangladesh. It highlights the challenges faced by the healthcare providers and the measures taken to manage the patients. The article also discusses the need for adequate resources and equipment to effectively treat COVID-19 patients. COVID-19 and food supply in Bangladesh: The COVID-19 pandemic has affected the food supply chain in Bangladesh, leading to disruptions in the availability and affordability of food. The article highlights the challenges faced by farmers, traders, and consumers and suggests measures to ensure food security during the pandemic. Online Education System in Bangladesh during COVID-19 Pandemic: The COVID-19 pandemic has disrupted the education system worldwide, and Bangladesh is no exception. In Bangladesh, schools, colleges, and universities were closed in March 2020, and traditional classroom teaching was replaced with online education. The transition to online education was not easy for everyone, as many students in Bangladesh come from low-income families and do not have access to computers, laptops, or the internet. This digital divide has resulted in a significant number of students being left behind. Moreover, online education has been challenging for many teachers, who have had to learn new technology and pedagogical approaches to teach their students effectively. In many cases, teachers and students have reported problems with internet

connectivity, power outages, and a lack of appropriate online teaching resources. Despite these challenges, online education has provided an opportunity for many students to continue their studies during the pandemic. Many schools and universities have developed online curricula, and teachers have used various online platforms to conduct classes and interact with their students.

Impact of the COVID-19 Pandemic on Domestic Violence in Bangladesh: The COVID-19 pandemic has also had a significant impact on domestic violence in Bangladesh. According to reports, incidents of domestic violence have increased since the pandemic began, as families have been forced to spend more time together in confined spaces. Many women in Bangladesh have reported experiencing physical, sexual, and emotional abuse during the pandemic. The lockdowns and restrictions on movement have made it more difficult for women to seek help and support, as they are often trapped at home with their abusers. Furthermore, the economic impact of the pandemic has also contributed to the rise in domestic violence in Bangladesh. Many families have lost their livelihoods, and the resulting stress and financial pressure have led to an increase in domestic violence.

6. Conclusion and Recommendations

In conclusion, the COVID-19 pandemic has presented significant challenges to Bangladesh, including the need for accurate forecasting, effective medical waste management, support for the tourism industry, public health strategy, prevention of child marriage, and adequate support for Rohingya refugees and migrant workers. The government needs to invest in healthcare infrastructure, increase public awareness of public health measures, enforce laws and policies to protect vulnerable communities, and improve resources and training for healthcare professionals. The pandemic has also highlighted the need for online education and measures to prevent domestic violence. Therefore, it is recommended that the government prioritize these issues to mitigate the impact of the pandemic on the country.

7. Conclusion

The COVID-19 pandemic has had a significant impact on Bangladesh, affecting multiple areas such as public health, tourism, food supply chains, and education. To mitigate the spread of the virus, increased testing, contact tracing, and public compliance with health guidelines are crucial. The government needs to ensure that adequate resources are available, including PPE, testing kits, and hospital beds. Innovative solutions could be explored to manage the increased production of medical waste sustainably. The pandemic has highlighted the challenges in Bangladesh's public health system, including a lack of resources, inadequate health infrastructure, and insufficient healthcare workers. There is a need for sustained investment and capacity building to improve the country's public health system. The pandemic has also led to increased risks of child marriage and domestic violence, highlighting the need for stronger child protection policies, support services, and education on gender-based violence. The government needs to prioritize the protection and support of vulnerable populations such as Rohingya refugees and migrant workers. The shift to online education systems has provided an opportunity to address the digital divide and improve access to education in Bangladesh.

8. References

- [1] ↑. M. R. B. a. M. T. M. K. b. Mossamet Kamrun Nesa a, "Forecasting COVID-19 situation in Bangladesh," *Biosafety and Health*, pp. 6-10, 2022.
- [2] 2. Uttama Barua¹ · Dipita Hossain¹, "A review of the medical waste management system at Covid-19," *Journal of Material Cycles and Waste Management*, vol. 23, no. 2087–2100, pp. 1-14, 2021.

- [3] S. M. N. Santus Kumar Deb1*, "Impact of COVID-19 Pandemic on Tourism: Perceptions from," *Department of Tourism and Hospitality Management, University of Dhaka, Dhaka-1000*, p. 14, 2020.
- [4] A. Haque, "The COVID 19 pandemic and the public health challenges in Bangladesh: a commentary," *Journal of Health Research*, pp. 1-5, 2020.
- [5] 1. M. A. S. M. S. B. Md. Jamal Hossain, "COVID-19 and child marriage in Bangladesh: emergency call to action," *BMJ Paediatrics Open*, vol. 5, no. e001328. doi:10.1136/ , pp. 1-2, 2021.
- [6] R. R. M. H. M. S. M. a. G. D. Banik, "COVID-19 pandemic and Rohingya refugees in Bangladesh: What are the major concerns?," *Global Public Health*, vol. 15, no. 10, 2020.
- [7] ↑. M. T. I. b. B. T. c. Mohammad Rezaul Karim a, "COVID-19 s impacts on migrant workers from Bangladesh: In search of policy intervention," *Bangladesh Public Administration Training Centre, Savar Dhaka-1343, Bangladesh*, p. 4, 2020.
- [8] M. A. M. E. A. M. J. H. S. M. M. H. A. F. H. Muhammad AR Bhuyan1, "Treatment of COVID-19 Patients at a Medical College hospital in Bangladesh," *Euroasian journal of hepato-gastroenterology*, vol. 10, no. 1, p. 4, 2020.
- [9] A. M. A. I. M. A. S. Y. F. a. D. A. Zabir, "COVID-19 and food supply in Bangladesh: a review," *South Asian Journal of Social Studies and Economics*, vol. 10, no. 1, p. 9, 2020.
- [10] M. R. S. a. I. S. Khan, "Online education system in Bangladesh during COVID-19 pandemic," *Creative Education*, vol. 12, no. 2, p. 12, 2021.
- [11] R. Sifat, "Impact of the COVID-19 pandemic on domestic violence in Bangladesh," *Asian journal of psychiatry*, pp. 1-3, 2020.

