

Online Consultation as A Rescue Measure for Children with Neurological and Neurodevelopmental Disorders in the COVID-19 Era

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DOI: [10.36348/sjm.2022.v07i04.004](https://doi.org/10.36348/sjm.2022.v07i04.004)

| Received: 07.03.2022 | Accepted: 11.04.2022 | Published: 20.04.2022

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Abstract

Background: A covid-19 pandemic is an unprecedented event, which has a profound impact on the lives of children with neurological and neurodevelopmental disorders besides other people. In Bangladesh, the effects of the Covid-19 pandemic on children with neurological and neurodevelopmental disorders have not been adequately studied. **Aim of the study:** The aim of this study was to assess the diseases status of children with neurological and neurodevelopmental disorders during the Covid-19 pandemic. **Methods:** This voluntary prospective observational study was conducted during the period from June 2020 to August 2020 with an attachment of the department Paediatric Neuroscience, Bangladesh Shishu Hospital & Institute, Dhaka, Bangladesh, and Neurogen Health Care, Dhaka, Bangladesh. A total of 78 children with at least one symptom of neurological and/or neurodevelopmental disorders were included as the study subjects of this study. Both previously diagnosed and newly recruited patients were accumulated as the study subjects. Both physical and online (With telephonic communication) consultation and follow-up were arranged for all the patients during the study period. All data were collected, processed, and analyzed by using MS Office and SPSS version 23 programs as per need. **Results:** In this study, the mean (\pm SD) age of the participants was 9.87 ± 2.59 years. The male-female ratio was 1.4:1. The majority of the participants were from rural areas (55) and only 2 were from Covid-19 affected. About half of the participants (49%) were with epilepsy. Besides this, 'impairment in social interaction, communication and behavior problem', CP with global developmental delay, syndromic child, and 'hyperactivity and inattention were found in 22%, 13%, 10%, and 6% participants respectively. The majority of the patients (53%) of this study were under antiepileptic therapies. Besides this, 9%, 13%, 5%, 14%, and 6% of participants were taking Immunosuppressive therapies, physical or occupational therapies, psychotherapy, combination therapy, and some other therapies respectively. **Conclusion:** Epilepsy is the most common disorder among children with neurological and neurodevelopmental disorders who sought for online consultation. Online consultation followed by subsequent physical consultation may be considered as an effective approach in managing patients with neurological and neurodevelopmental disorders during any pandemic situation like Covid-19.

Keywords: Online consultation, Children, Neurological, Neuro-developmental disorders, Covid-19.

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1. INTRODUCTION

In Bangladesh, the effects of the Covid-19 pandemic on children with neurological and neurodevelopmental disorders have not been adequately studied. This was a prospective observational study that was conducted during the period from June 2020 in Bangladesh. In Bangladesh, on the 8th March 2020, the first Covid-19 patient was detected [1]. Covid-19 disease caused by SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus-2) was declared as a global epidemic by WHO (World Health Organization) on the 11th March 2020 [2]. Children

with neurodevelopmental disorders (NDD) constitute a sizeable segment of the pediatric population with high healthcare service requirements compared to the general population [3]. Compared to typically developing children (TDC), children with any type of neurodevelopmental disorders (NDDs) are more likely to suffer from several mental as well as physical difficulties during a disaster as the unpredictable changes around them and alterations to their routines [4]. In some recent studies, caregivers in Italy found that children with autism spectrum disorder were engaged in more intense and frequent disruptive

behavior during Covid-19 quarantine [5]. The quality of life (QOL) describes an individual's subjective perception of their contentious position in their life, as evidenced by their psychological, physical, and social functioning [6]. The quality of life (QOL) of parents was significantly reduced by the stress and lack of coping skills in the aspect of increasingly aggressive behavior in their neurodevelopmental disorders (NDD) children [7]. Generally, two primary lifestyle factors change the quality of life (QOL) of most children with NDD. The first one is "difficulties with their sleep cycles", that are basically associated with not only "children's mental problem" but also "poorer parent mental health" as well as higher parenting stress [8]. The second one is "parents' work patterns" and concerns about financial stability [9]. The stresses which parents carry from their jobs impairs their childcare skills and also affects the well-being of the children [10].

2. OBJECTIVE

General Objective

- To assess the diseases status of children with neurological and neurodevelopmental disorders during the Covid-19 pandemic.

Specific Objective

- To assess the Socio-demographic status of children with neurological and neurodevelopmental disorders.
- To evaluate diseases, lifestyle changes, and treatment status of children with neurological and neurodevelopmental disorders during the Covid-19 pandemic.

3. METHODOLOGY AND MATERIALS

This voluntary prospective observational study was conducted during the period from June 2020 to August 2020 with an attachment of the department of Paediatric Neuroscience, Bangladesh Shishu Hospital & Institute, Dhaka, Bangladesh, and Neurogen Health care, Bangladesh. In total 78 children with at least one symptom of neurological and/or neurodevelopmental disorders were included as the study subjects of this study. Both previously diagnosed and newly recruited patients were accumulated as the study subjects. Both physical and online (With telephonic communication) consultation and follow-up were arranged for all the patients during the study period. Properly written consents were taken in favor of all the participants

before data collection. Ethical approval had been taken from the ethical committee of the mentioned hospital. As per the inclusion criteria of this study, only children of age between 8 months and 14 years were included. On the other hand, as per the exclusion criteria, patients without proper documents and communication were excluded. Moreover, patients were excluded if they had any types of coexisting neurodegenerative and/or neuromuscular disorders. All patients were advised of home-based therapy as per the institutional protocol. A predesigned questionnaire was used for data collection. All data were collected, processed, and analyzed by using MS Office and SPSS version 23 programs as per need.

4. RESULTS

In this study, the mean (\pm SD) age of the participants was 9.87 ± 2.59 years. Among total of 78 participants, 71% were male whereas 29% were female. So, male participants were dominating in number and the male-female ratio was 1.4:1. In total 30(38%) participants were previously seen and defined as neurological and neurodevelopmental disorders patients. The rest 13% were recruited through online follow-up and 49% through direct follow-up during the study. The majority of the patients were from rural areas which were 55%. As per the sibling status, it was found that the majority 59% of patients had one sibling. Among total participants, only 2 (3%) were from Covid-19 affected families where at least one Covid-19 patient was reported during the tenure of this study. In analyzing the status of the disease as per the diagnosis of participants we observed that about half of the patients (49%) were with epilepsy. Besides this, 'impairment in social interaction, communication and behavior problem', CP with global developmental delay, syndromic child, and 'hyperactivity and inattention were found in 22%, 13%, 10%, and 6% patients respectively. In assessing the lifestyle changes among participants, we observed, 62% of patients used to perform less physical activities. Besides this, 42%, 24%, and 15% of patients were associated with alteration of sleep rhythm, late bedtime, and late waking time respectively which was remarkable. The majority of the patients (53%) of this study were under antiepileptic therapies. Besides this, 9%, 13%, 5%, 14%, and 6% of patients were taking Immunosuppressive therapies, physical or occupational therapies, psychotherapy, combination therapy, and some other therapies respectively.

Table 1: Socio-demographic status of participants (N=78)

Characteristics	n	%
Gender wise participants		
Male	55	71%
Female	23	29%
Patient types as per recruitment		
Previously seen	30	38%
Through online follow-up	10	13%
Through direct follow-up	38	49%
Residential status		
Rural	43	55%
Urban	35	45%
Number of siblings		
0	23	29%
1	46	59%
2	9	12%
Covid-19 affected family		
Yes	76	97%
No	2	3%

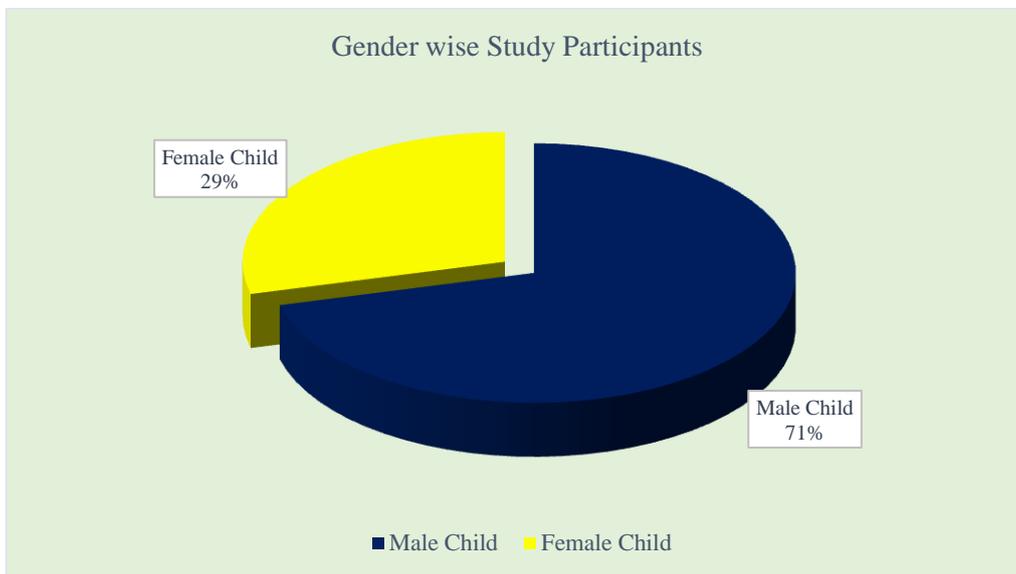


Figure I: Gender Wise Participants

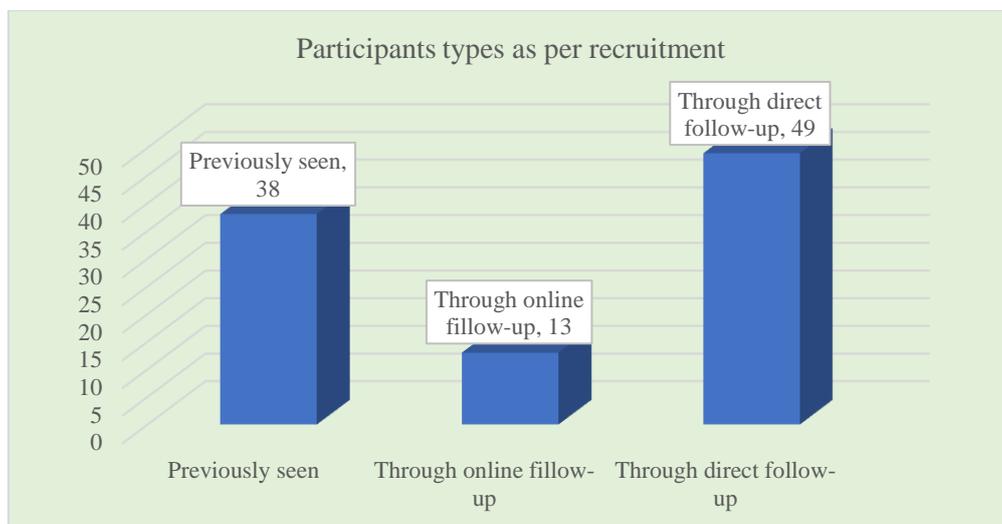


Figure II: Participants types as per recruitment

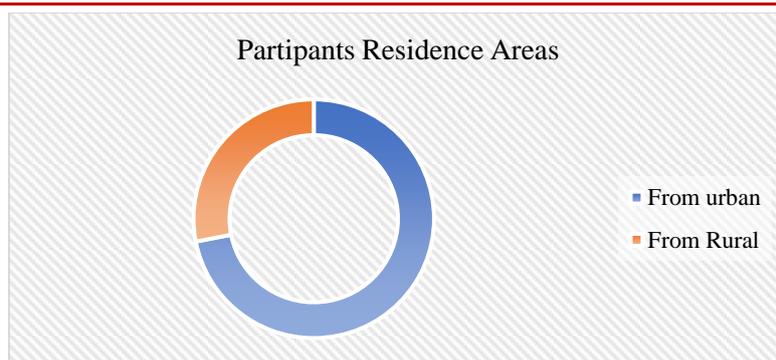


Figure III: Participants residence areas

Table 2: Diseases status as per diagnosis of participants (N=78)

Diseases findings through diagnosis	n	%
Epilepsy	38	49%
Impairment in social interaction, communication, and behavior problem	17	22%
CP with global developmental delay	10	13%
Syndromic child	8	10%
Hyperactivity and inattention	5	6%

Table 3: Lifestyle changes among participants (N=78)

Lifestyle changes	n	%
Alteration of sleep rhythm	33	42%
Late bedtime	19	24%
Late waking time	12	15%
Both late bedtime and waking time	7	9%
Prolonged use of social media and games	16	21%
Less physical activities	48	62%
Increased fast-food consumption	14	18%

Table 4: Therapy status among participants (N=78)

Therapies	n	%
Antiepileptic treatments	41	53%
Immunosuppressive therapies	7	9%
Physical or occupational therapies	10	13%
Psychotherapy	4	5%
Combination therapy	11	14%
Other therapies	5	6%

5. DISCUSSION

The aim of this study was to assess the diseases status of children with neurological and neurodevelopmental disorders during the Covid-19 pandemic. In this study, among a total of 78 participants, 71% were male whereas 29% were female. In assessing the lifestyle changes among participants, we observed, 62% of patients used to perform fewer physical activities. Besides this, 42%, 24%, and 15% of patients were associated with alteration of sleep rhythm, late bedtime, and late waking time respectively which was remarkable. In a study, it was reported that the Covid-19 pandemic is linked to a disaster-like condition that is likely to accelerate immense psychological problems in general pediatric clientele' ranging from sleep disorders, anxiety, behavioral issues, and anorexia [11]. Lockdown for Covid-19 and quarantine measures also posed some other health issues for children with

“neurodevelopmental disorders” like increased sedentary lifestyle; sleep disorders, impaired diet, weight gain as well as addiction to technological devices which may lead to poor sleep hygiene [12]. During this study, besides direct consultation online as well as telephonic consultancies were ensured for all the patients of great distances. In a study, they reported, although online therapy for children with neurological and neurodevelopmental disorders can be challenging, it is the only one that is cost-efficient, flexible, and provides individualized therapy during a pandemic [13]. For high functioning children, online therapy may provide a safe place to talk, check their moods and can reduce anxiety [14]. In our study, the majority of the patients (53%) of this study were under antiepileptic therapies. Besides this, 9%, 13%, 5%, 14%, and 6% of patients were taking Immunosuppressive therapies, physical or occupational therapies, psychotherapy,

combination therapy, and some other therapies respectively. During recent years, the adaptation of such therapies, professional consultations, and parent training through telephone or social media platforms have produced equally favorable outcomes while creating more cost-effective as well as easily accessible support for parents of patients [15].

Limitation of the study

Though it was a single-centered study with a limited sample so the findings of the study might not reflect the exact scenario of the whole country.

6. CONCLUSION & RECOMMENDATION

Epilepsy is the most common disorder among children with neurological and neurodevelopmental disorders who sought online consultation. In any pandemic situation like Covid-19, online as well as subsequent physical consultation may be considered as an effective approach in managing patients with neurological and neurodevelopmental disorders. Epilepsy patients needed urgent online visits for seizure control. Hyperactivity and inattention patients needed medicine and behavioral management. So, for ensuring more specific findings we would like to recommend conducting similar studies with larger sample sizes in several centers in the country.

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