



# **Socio-Demographic and Clinical Profile of Neurological Movement Disorders Patients: A Tertiary Care Hospital Study in Bangladesh**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## **Article Information**

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## **ABSTRACT**

**Background:** Movement disorders may present in emergency medical services in an acute severe form which can be life threatening if not recognized. Neurological movement disorders (NMD) can result from many types of brain injury like head trauma, inflammation, infection, metabolic disturbances, toxins or unintended side effects of medications. In Bangladesh, the relative frequency and spectrum of neurological movement disorders (NMD) have not been studied widely.

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**Aim of the Study:** The aim of this study was to assess the socio-demographic and clinical profile of neurological movement disorders patients.

**Methods:** This was a prospective descriptive single center study which was conducted in the department of Neurology, Tairunessa Memorial Medical College Hospital, Gazipur, Bangladesh during the period from January 2022 to December 2022. In total 43 patients with neurological movement disorders attended the mentioned hospital were enrolled in this study as study subjects. Proper written consents were taken from all the participants before data collection. All data were processed, analyzed and disseminated by using MS Excel and SPSS version 23.0 program as per necessity.

**Results:** In this study, the mean age of the respondents was  $43.47 \pm 11.59$  years and the male-female ratio was 1.3:1. Majority of the participants were obese (42%) or with overweight (33%) status. Unemployed respondents were the highest in number (44%). Majority of our participants were married (67%) and taken education up to primary level (51%). More than 80% of our respondents were with hyperkinetic disorders (81%) and the rest 19% were with hypokinetic movement disorders; acute cases were found as 61.9%. Majority of the cases (63%) were with moderate, 28% were with severe and the rest 9% were with mild symptoms. As the etiology of neurological movement disorders among our patients, hyperglycemia, stroke and autoimmunity were found among 42%, 19% and 16% cases respectively.

**Conclusion:** Over aged obese as well as overweight persons are mainly prone to neurological movement disorders. The frequency of hyperkinetic disorders is higher among to neurological movement disorder patients. Hyperglycemia may be considered as the most potential etiology of NMD.

*Keywords: Socio-demographic profile; clinical; neurological; movement disorder.*

## 1. INTRODUCTION

“Neurological movement disorder (NMD) may be defined as any movement disorder that evolves over hours to days in which failure to diagnose and manage patients appropriately and that can result in high morbidity and mortality. The early recognition and effective management of NMD can favorably alter the outcomes” [1]. “Neurological movement disorder (NMD) can be hyperkinetic or hypokinetic emergencies. Hyperkinetic NMD include chorea/hemiballismus, tremor, dystonia, and myoclonus which can present in acute and aggressive forms. Hypokinetic NMD include acute parkinsonism, neurolept malignant syndrome, parkinsonism hyperpyrexia syndrome, malignant catatonia and serotonin syndrome” [2]. “The overall prevalence of neurological movement disorder in an emergency setting is as low as 0.073%” [3]. Most of the literatures available on neurological movement disorder are in the form of case series and case reports. There are few large systematic studies on the NMDs globally and fewer from Indian subcontinent. Dalocchio C et al. [3] reported “96 cases with acute NMD and majority was hyperkinetic neurological movement disorder. Tremor was the most common hyperkinetic NMD in their cohort”. Goraya JS [4] from “India reported NMD in 92 children and myoclonus was the most common

hyperkinetic neurological movement disorder”. Epidemiological studies reported on the features and classification of NMD widely in the literatures, [5,6] which are extremely valuable for improving healthcare practices. “Epidemiological information regarding NMD is an instrument for healthcare planning that informs guidelines and improvements” [7]. “Consequently, analysis on certain factors of NMD such as risk factors, mortality and morbidity, prevalence and assistance provided to patients is required” [8]. “Such information facilitates identification of a population profile and allows comparison of characteristics with data in other studies that have been consolidated in the literature” [9,10]. “Some studies on neurological diseases have revealed that, one of the most recurrent diagnoses consists of movement disorders” [11]. “Neurological disorders resulting from lesions in the basal nuclei, which result in involuntary movements” [12]. “Hyperkinetic NMD syndromes are characterized by hyperactive involuntary and uncontrollable movements, like ballism, dystonia, athetosis, myoclonus, tremor, tics and others” [13,14]. “Antagonistically, hypokinetic syndromes, for which the prototype is Parkinson’s disease, are characterized by slowness and decreased voluntary movements, in addition to resting tremor, muscle stiffness and postural instability” [14,15]. “This group also includes other parkinsonian syndromes like

progressive supranuclear palsy (PSP), cortico-basal degeneration, multiple system atrophy (MSA) and vascular and drug-induced secondary parkinsonism” [16]. “After Alzheimer’s disease, Parkinson’s disease is considered to be the second most common degenerative disorder” [17]. “Although its etiology is not yet well defined, it is characterized by degeneration of dopaminergic neurons in the nigrostriatal system of the basal nuclei” [18]. As NMD, the prevalence of Parkinson’s disease in the general population has been estimated to be 0.3%, [19]. The main object of this study was to assess the socio-demographic and clinical profile of neurological movement disorders patients.

## 2. METHODOLOGY

This was a prospective descriptive single center study which was conducted Department of Neurology, Tairunessa Memorial Medical College, Gazipur, Bangladesh during the period from January 2022 to December 2022. In total 43 patients with neurological movement disorders attended the mentioned hospital were enrolled in this study as study subjects. Proper written consents were taken from all the participants before data collection. The brain imaging details, biochemical investigations and electroencephalographic details of patients if done were collected. The treatment details and outcome at the time of discharge or referral to other hospitals were recorded. The whole intervention was conducted in accordance with the principles of human research specified in the Helsinki Declaration [20] and executed in compliance with currently applicable regulations and the provisions of the General Data Protection Regulation (GDPR) [21]. As per the inclusion criteria of this study, several aged patients of either gender with neurological movement disorders attended the mentioned hospital were included in the study. On the other hand, according to the exclusion criteria of this study, patients with psychogenic movement disorders and those not willing to give consent were excluded from the study. All the demographic and clinical data of the participants were recorded. A predesigned questioner was used in data collection. All data were processed, analyzed and disseminated by using MS Excel and SPSS version 23.0 program as per necessity.

## 3. RESULTS

In this study, among total 43 participants, 56% were male whereas the rest 44% were female.

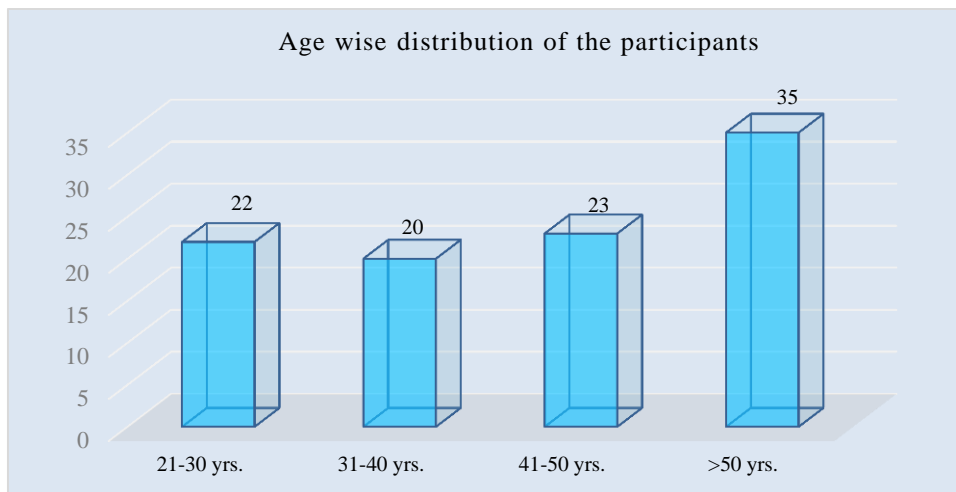
So, male participants were dominating in number and the male-female ratio was 1.3:1. The highest number of our respondents (35%) were from >50 years’ age group. The mean age of the respondents was  $43.47 \pm 11.59$  years. On the other hand, in analyzing the BMI of the participants we observed that, majority of the participants were obese or with overweight status; 42% were with BMI:  $\geq 25$  and 33% were with BMI: 23.0-24.9. In analyzing the occupational status of our participants, we found unemployed, housewife, businessmen, service holder and day laborer as 44%, 21%, 16%, 9% and 9% respectively. Majority of our participants (67%) were married, whereas 9% were unmarried and rest 21% were widow. In analyzing the educational status of our participants, we observed that, among total patients, more than fifty percent (51%) were primary level completed, 37% were secondary level completed and the rest 12% were at least graduate. More than 80% of our respondents were with hyperkinetic disorders (81%) and the rest 19% were with hypokinetic movement disorders. Among total participants, acute cases were found as 61.9%. In analyzing the severity status, we found that, majority of the cases (63%) were with moderate, 28% were with severe and the rest 9% were with mild symptoms. As the etiology of neurological movement disorders among our patients, hyperglycemia, stroke and autoimmunity were found among 42%, 19% and 16% cases respectively. In CT scan, caudate and putamen was found in 47% cases. Finally, majority of the participants (51%) were found as improved in condition at the follow-up stage.

## 4. DISCUSSION

The aim of this study was to assess the socio-demographic and clinical profile of neurological movement disorders patients. In this study, among total 43 participants, 56% were male whereas the rest 44% were female. So, male participants were dominating in number and the male-female ratio was 1.3:1. Similarly, some other studies have shown the higher prevalence among males [22,23]. The highest number of our respondents (35%) were from >50 year’s age group. The mean age of the respondents was  $43.47 \pm 11.59$  years. But Pagano et al. [24] found such disorders among older population. In analyzing the BMI of the participants, we observed that, majority of the participants were obese or with overweight status; 42% were with BMI:  $\geq 25$  and 33% were with BMI: 23.0-24.9.

**Table 1. Distribution of socio-demographic status of the study respondents (N=43)**

Characteristics	Frequency (n)	Percentage (%)
Age in year		
21-30 yrs.	9	22%
31-40 yrs.	8	20%
41-50 yrs.	11	23%
>50 yrs.	15	35%
Gender		
Male	24	56%
Female	19	44%
BMI		
< 18.5	3	7%
18.5-22.9	8	19%
23.0-24.9	14	32%
≥ 25	18	42%
Occupation		
Unemployed	19	44%
Housewife	9	21%
Business	7	17%
Service holder	4	9%
Day laborer	4	9%
Marital status		
Married	29	68%
Unmarried	5	11%
Widow	9	21%
Education		
Primary level completed	22	51%
Secondary level completed	16	37%
Graduation and above	5	12%



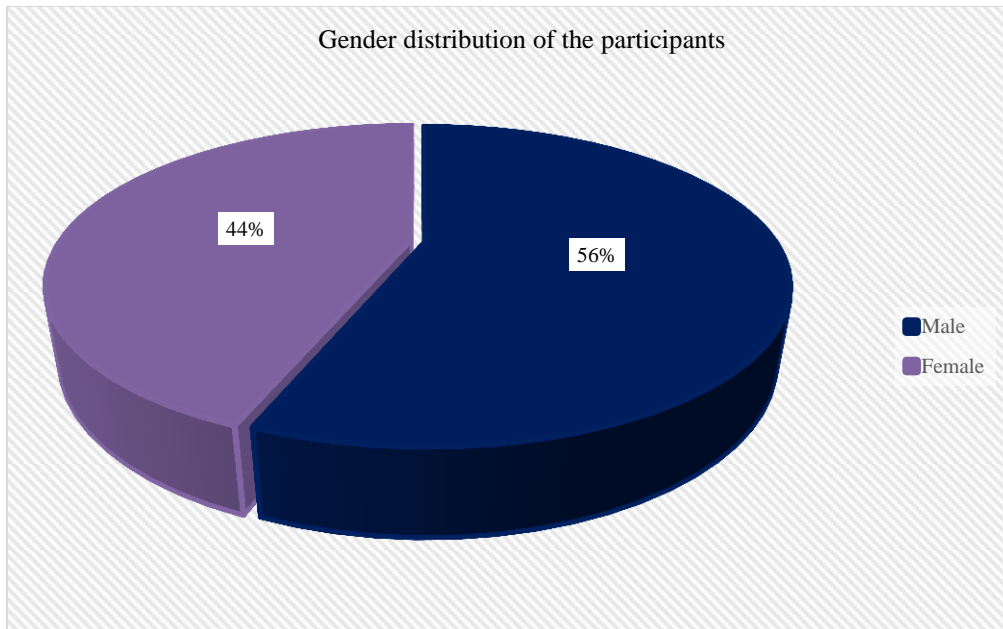
**Fig. 1. Column chart showed age wise distribution of participants (N=43)**

**Table 2. Distribution of onset of NMD among patients (N=43)**

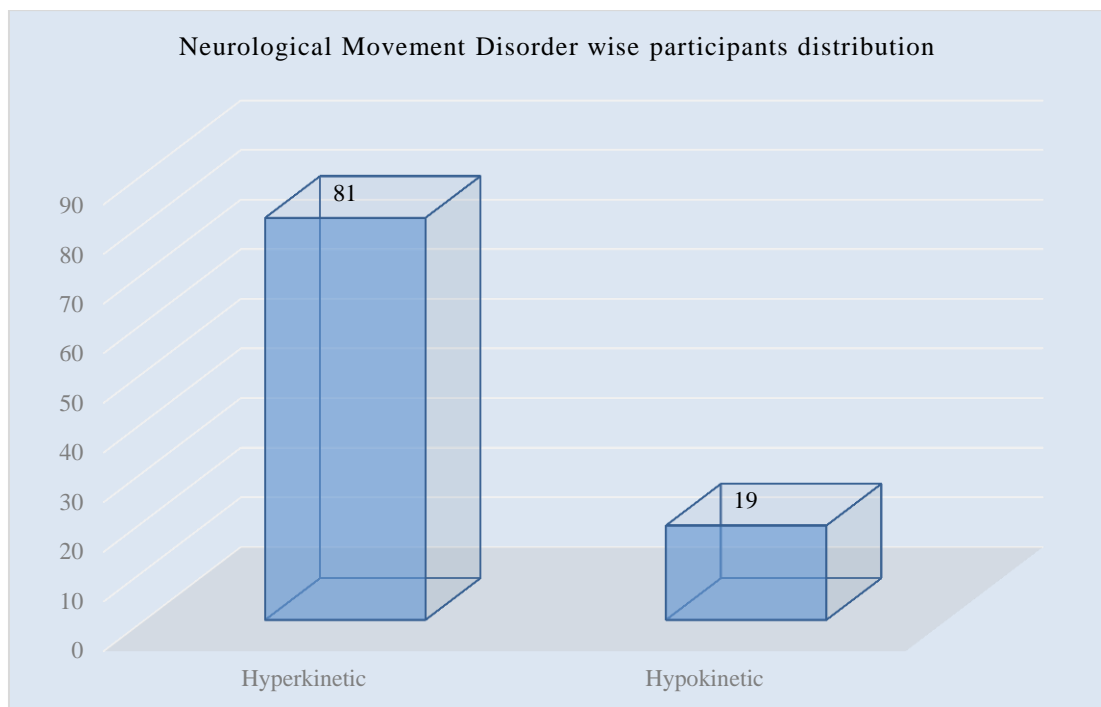
Onset	Frequency (n)	Percentage (%)
Hyper-acute	9	21.4%
Acute	27	61.9%
Sub-acute	7	16.7%

**Table 3. Distribution of severity of NMD among patients (N=43)**

Severity	Frequency (n)	Percentage (%)
Mild	4	9%
Moderate	27	63%
Severe	12	28%



**Fig. 2. Pie chart showed age wise distribution of participants (N=43)**



**Fig. 3. Column chart showed NMD wise study patients (N=43)**

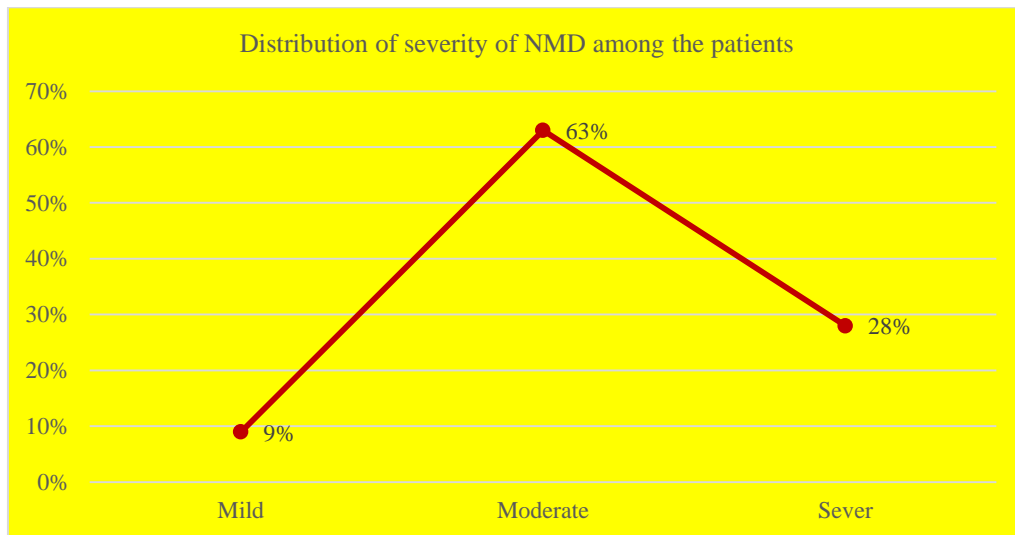


Fig. 4. Line chart showed severity of NMD of study patients (N=43)

Table 4. Distribution of etiology of NMD among patients (N=43)

Etiology	Frequency (n)	Percentage (%)
Hyperglycemia	18	42%
Stroke	8	19%
Autoimmune	7	16%
Infection	3	7%
Metabolic	2	5%
Genetic	1	2%
Drug-induced	1	2%
Undetermined	3	7%

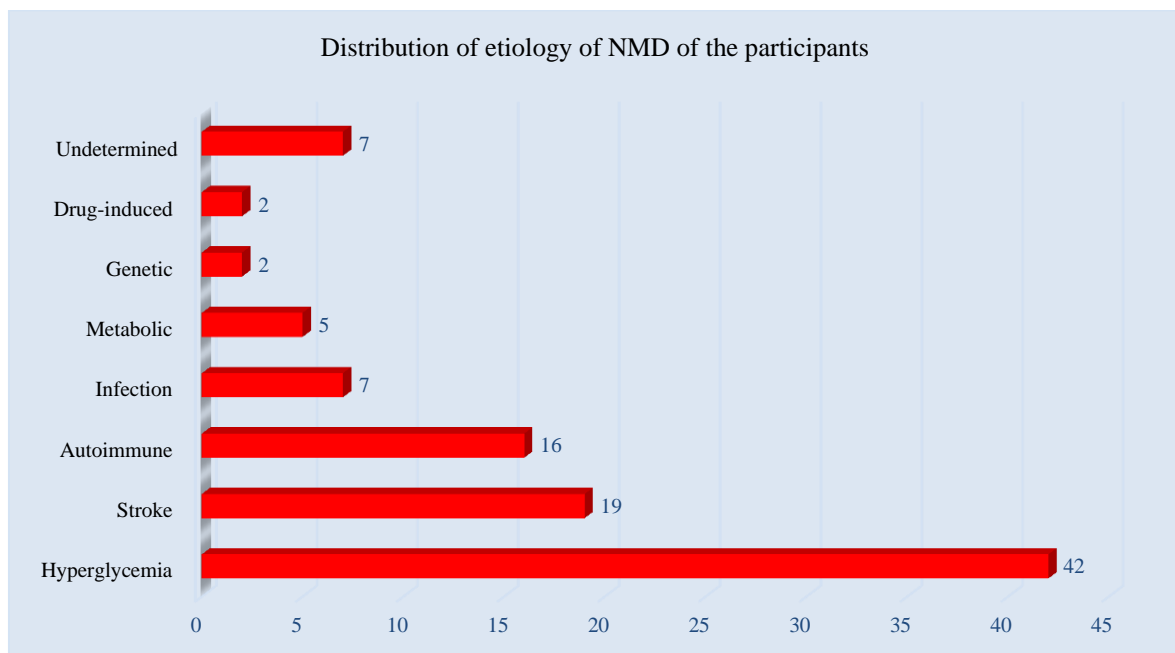


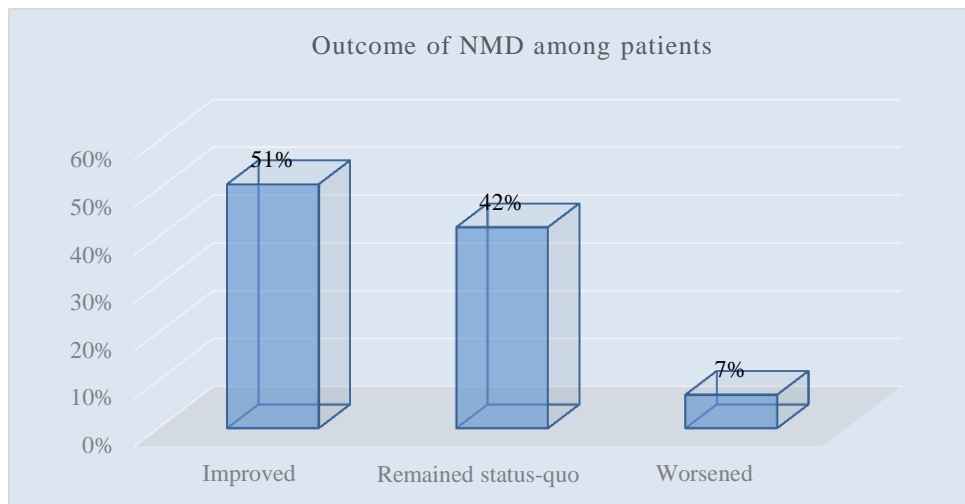
Fig. 5. Bar chart showed etiology of NMD of the respondents (N=43)

**Table 5. Distribution of CT head lesions of NMD among patients (N=43)**

CT head lesions	Frequency (n)	Percentage (%)
Caudate and putamen	20	46%
Putamen only	12	28%
No abnormality	11	26%

**Table 6. Distribution of outcome of NMD among patients (N=43)**

Outcome	Frequency (n)	Percentage (%)
Improved	22	51%
Remained status-quo	18	42%
Worsened	3	7%



**Fig. 6. Column chart showed Outcome of NMD among patients**

Majority of our participants (67%) were married, whereas 9% were unmarried and rest 21% were widow; findings were similar to another study [25]. In analyzing the educational status of our participants, we observed that, among total patients, more than fifty percent (51%) were primary level completed, 37% were secondary level completed and the rest 12% were at least graduate. More than 80% of our respondents were with hyperkinetic disorders (81%) and the rest 19% were with hypokinetic movement disorders. Among total participants, acute cases were found as 61.9%. Hyperkinetic syndromes are characterized by hyperactive involuntary as well as uncontrollable movements like ballism, dystonia, athetosis, tremor, tics, myoclonus and others [26,27]. In analyzing the severity status, we found that, majority of the cases (63%) were with moderate, 28% were with severe and the rest 9% were with mild symptoms. Although the etiology of such disorder is not yet well defined, it may be characterized by degeneration of dopaminergic neurons in the nigrostriatal system of the basal nuclei [28]. As the etiology of neurological movement disorders among our

patients, hyperglycemia stroke and autoimmunity were found among 42%, 19% and 16% cases respectively. In CT scan, caudate and putamen was found in 47% cases.

### 5. LIMITATION OF THE STUDY

This was a single centered study with small sized samples. Moreover, the study was conducted at a very short period of time. So, the findings of this study may not reflect the exact scenario of the whole country.

### 6. CONCLUSION AND RECOMMENDATION

Aged obese as well as overweight persons are mainly prone to neurological movement disorders. The frequency of hyperkinetic disorders is higher among to neurological movement disorder patients. Hyperglycemia may be considered as the most potential etiology of neurological movement disorders. For getting more specific results, we would like to recommend for conducting similar more studies in several places with larger sized samples.

## CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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