DEPARTMENT OF PSYCHIATRY, SCHOOL OF MEDICINE, COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY

Prevalence and Associated Factors of Functional Neurologic Symptom Disorder among Patients Attending Psychiatric Outpatient Clinic at TASH from Hamle 1/2011 – Hamle 30/2013 E.C: A Retrospective Electro Medical Record Review

A Final Research Thesis Submitted to the Department of Psychiatry in Partial Fulfillment of the Requirements for the Specialty Program in Psychiatry

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Acronyms

CD: Conversion Disorder

FNSD: Functional Neurologic Symptom Disorder

PNES: Psychogenic Non Epileptic Seizures

MDD: Major Depressive Disorder

OCD: Obsessive Compulsive Disorder

TIA: Transient Ischemic Attack

HCR: Hysterical Conversion Disorder

TBI: Traumatic Brain Injury

TASH: Tikur Anbessa Specialized Hospital

EEG: Electroencephalogram

DSM 5: Diagnostic and Statistical Manual of Mental Disorders, 5th edition

Summary of the research

Background: Functional neurologic symptom disorder is one of the somatic symptom disorders characterized by different subtypes of presentations. Its prevalence and associated factors vary in between the developed and developing countries including the subtypes too.

Study objective: To determine the prevalence and associated factors of functional neurologic symptom disorder in patients attending psychiatric clinic at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia.

Method: A retrospective electronic medical record review was done. The study participants were selected from the registry of the outpatient psychiatric clinic in the duration of Hamle 1/2011 – Hamle 30/2013 E.C. Data was collected by means of data extraction sheet. The Collected data was entered and analysed using SPSS version 20. A descriptive analysis was conducted. Univariable then multiple logistic regression was done to determine the factors associated with FNSD.

Results: In this study, there were a total of 2089 patients seen from the time of from Hamle 1/2011 – Hamle 30/2013 E.C. From the total seen patients 105 were diagnosed with conversion disorder making its prevalence 5.02% and incidence 2.20%. Most patients (63.8%) were below the age of 20, with mean age of presentation of 20 years and SD of 10 years. The mean duration of presentation was less than three months (45.7%). The commonest subtype of functional neurological symptom disorder was found to be attack or seizure (68.6%). The commonest psychiatric comorbidities were found to be mood spectrum disorders. Significant association was seen between age younger 20 years, female gender and urban area of residency and diagnosis of FNSD.

Conclusion: The sociodemographic characteristics results from our study are comparable to other studies form a similar setup, and so are the clinical characteristics.

1. Introduction

1.1 Background

Functional neurological symptom disorder (conversion disorder) is a psychiatric condition which is characterized by symptoms and signs affecting voluntary motor or sensory activities which can't be explained by neurologic or medical causes. Psychological factors like conflict and stress are suggested to be linked with the deficits. Common presentations of conversion disorder are blindness, paralysis, dystonia, psychogenic nonepileptic seizures (PNES), anesthesia, swallowing difficulties, motor tics, difficulty walking and anesthesia. [1]

The concept of conversion (hysteria) traces back to the ancient times where Hippocrates believed the symptoms were results of the uterus wandering around the body pressing different organs. This was modified through time especially in the 19th and 20th centuries by Sigmund Freud where he forwarded the concept of psychodynamic theories concerning unconscious conflicts and wishes transforming to bodily symptoms. [1]

Epidemiologically, the results from high income countries (England and USA) are mixed concerning individual symptoms and full diagnosis. It is estimated that up to one-fourth of all patients in a general hospital setting have individual symptoms of conversion, with 5% of these meeting the full diagnostic criteria. These figures increase in neurologic populations, in which it is estimated that 20% of patients attending a neurologic outpatient clinic have symptoms of conversion, whereas the incidence was found to be increased in population based studies and primary settings. [2]

A study from high income country (Sweden) showed that conversion disorder affects women, with an age of onset across life span, more than men. It has showed that it affects more people who live in rural areas with low level of education and who belonged to a lower socioeconomic class. [3]

In a study done in Australia, Over a 17 month period, a total of 884 patients presented for neurology assessment. Of these, 137 (15%) were classified as having a functional neurological disorder. This was the third most common presentation overall after headache and movement disorders. [4]

Though there isn't an underlying pathology, affected patients do have burden of health costs and sometimes develop long term disability. Symptoms persist or worsen in 40–66% of patients at long term follow-up. Some patients undergo extensive investigations and see many clinicians before the final diagnosis is made causing delay in diagnosis and management. In general, management is challenging in patients with long standing symptoms. [4]

A population based study from Turkey has showed that the life time prevalence of conversion disorder with pseudoneurological symptoms or deficits was 5.6% among a total sample of 1086. It was commonly seen in females (86.9%) and the commonest subtype being fainting, seen in 65.6% of patients. And 77% had no comorbid psychiatric diagnosis. [5]

A Hospital based cross sectional study from an upper middle income country, Iraq, has found the prevalence of FNSD to be 18.2%. From the total patients 80.2% were females. It showed a relatively higher prevalence than the mentioned high income countries whereas the gender prevalence is similar. [18]

Considering low income countries, there were few studies done in Africa and it was minimally investigated. A study done in Tanzanian Neurologic referral hospital has found the prevalence of FNSD to be 2.2 % where half of the patients had clinical presentation of PNES. [6]

In another retrospective hospital based study from a low income country, Sudan, the prevalence of FNSD was found to be 0.4%. Of these patients, 60% were females, 80% were below the age of 25 years and the commonest presentation being PNES (82.5%). This shows a lesser

prevalence from the higher income countries but a commonality in terms of prevalence in gender and age specific groups. [19]

As to my knowledge and search, the prevalence of FNSD was not studied in Ethiopia. So this study aims to determine the prevalence and associated factors of FNSD and related sociodemographic factors.

1.2 Statement of the problem

Tikur Anbessa Specialized Hospital is one of the tertiary referral hospitals in Addis Ababa having many departments. There are a number of patients who have follow up at psychiatry clinic for different diagnoses including FNSD. There hasn't been a research done on the prevalence of FNSD and associated factors, which would create a gap of due focus in proper identification of the illness. Apart from identification, the unknown prevalence would hinder the proper mobilization of resources (skilled mental health professionals) in treating the illness. Additionally, not recognizing the burden of illness wouldn't allow a joint management in between neurology and psychiatry departments.

1.3 Rationale

This research would be useful in determining the prevalence and associated factors of functional neurological symptom disorder in one of the referral hospitals of Ethiopia. Similar researches haven't been done so it would help in being an eye opener for further large community based studies. It would also be important in identifying and managing cases with quality care.

1.4 Research Question

What is the prevalence and associated factors of FNSD in patients attending psychiatric outpatient clinic at TASH, Addis Ababa, Ethiopia?

2. Objective of the study

2.1 General Objective

- To determine the prevalence and associated factors of functional neurologic symptom disorder in patients attending psychiatric clinic at Tikur Anbessa Specialized Hospital.

2.2 Specific Objectives

- To determine the prevalence of FNSD and its subtypes at TASH psychiatric OPD, Addis Ababa, Ethiopia.
- To describe the socio-demographic and the clinical factors (duration of illness, precipitants, comorbid psychiatric, medical and neurologic disorders) seen in patients with FNSD.
- To investigate the socio-demographic factors (age, gender and residence) associated with FNSD in relation to other psychiatric diagnosis.

2.3 Hypothesis

Functional neurologic symptom disorder will be twice prevalent in women than men. [6]

3 Literature Review

There aren't many researches done on the prevalence and associated factors of functional neurologic symptom disorder in different countries and especially in African countries. A research done in 2015, in USA reviewed the existing literatures on the epidemiology, comorbidity and associated factors, prognosis and mortality of PNES. It was reported in most tericiary hospitals that 5 – 10 % of outpatients in epileptic clinics and 20 – 40% of inpatients had PNES. It also reviewed a retrospective research done in the US where the incidence of PNES was found to be 3.03 per 100000 per year. This research also included findings of prevalence of PNES referred to epilepsy clinics as 10 – 20 %. It was also found that in most patients it occurred in the age of young adulthood and female gender. The review also included different researches showing the comorbidity of PNES with epilepsy to be from 5 – 50 %. In terms of associated factors, most researches showed that childhood sexual abuse has a high association with PNES followed by physical abuse, TBI and other medical comorbidities. [11]

An older retrospective study done in 1984, USA, Vanderbilt University Hospital analysed 1000 consultation cases to the psychiatry department over 42 months period. As a result, conversion disorder was found to have prevalence of 5%. From these, 33 (66%) of them then received a primary diagnosis of conversion disorder, while the remaining 17 (34%) had a primary diagnosis of somatization disorder with a conversion symptom as the primary presenting clinical feature. Most patients were referred from neurology and neurosurgery units. Of the patients, 53 were females and 9 were males. Majority were less than 40 years of age, educated till grades 6 to 11 and from rural settings. Of the patients, 18 presented with spasm, 16 with weakness, 10 with paresthesia, 8 with seizures, 4 with syncope, 3 with visual disturbance, 2 with coma and one with 'psychosis'. 18 had comorbid somatization disorder, 5 had comorbid depression, 10 had comorbid personality disorders, 4 had substance abuse, 1 had factitious illness and 3 had mental retardation. 4 patients had

comorbid seizure disorder, 2 had delirium, 1 head trauma, 1 TIA, 1 cerebral palsy and 1 atrioventricular malformation. [7]

In a cohort study done in Australia in 2013, patients from a single outpatient neurology clinic were studied over a period of 17 months with an objective to determine duration of symptoms, clinical presentation and outcome of functional neurological disorder. Over a 17 months of duration a total of 884 patients presented for assessment from which 137(15%) had FNSD, from these patients 71% had neuroimaging and 49% had neurophysiological investigations. From the total number of patients, 104(75.9%) were females whereas 33 were males. Mean age of presentation was 45 years with the age range of (16 -80). 10.9% (15) patients had comorbid psychiatric diagnosis. From the subclasses of FNSD the commonest presentation was sensory loss of 48.2% (66), limb weakness 51 (37.2%), PNES 19(13.9%), unclassified 16 (11.7%), tremor 15(10.9%), cognitive 11(8%), speech 9 (6.6%), visual 9(6.6%), gait 8(5.8%) and dystonia 3(2.2%). 47% (59) of the patients had their symptoms for less than 6 months and 26% (33) of patients had symptoms for 2 years or more. There were no significant differences between the type of presentation and duration of symptoms. [4]

In a prospective cohort study done in Scotland with objectives of determining the proportions of unexplained symptoms in outpatient neurologic patients and the changes in diagnosis over the period of December 2002 to February 2004, a total of 1144 patients participated. From the total 209(18%) had diagnosis of conversion disorder. From the patients with conversion disorder 85 of them had nonepileptic attacks, 68 had sensory loss (12-hemisensory loss, 54-other functional sensory loss, 2- vision loss) whereas 35 had weakness, 10 had mixed sensory and motor weakness, 9 had movement disorder and 2 gait disorder. [9]

A study was done in Norway in 2002 to determine the psychiatric comorbidity and aggression in patients with PNES compared to patients with somatoform disorders. The study had 23 patients with PNES with a mean age of 32 years where they were assessed with different psychiatric assessment methods for comorbidities. From the patients 22 had

comorbid psychiatric diagnoses the commonest being depressive disorder 13(57%) followed by generalized anxiety disorder 9(39%), posttraumatic stress disorder 8(35%), Bipolar disorder (22%), phobic anxiety disorder 3(13%), obsessive compulsive disorder 2(9%) and others 3(13%). [13]

In a cross sectional study done in Turkey, town of Manisa, in 2000 a cluster sampling was used to select a total sample of 1086 individuals in the age range of 15-65 years. Of the subjects the lifetime prevalence of conversion disorder with pseudoneurological symptoms or deficits was 5.6% (n = 61). Only 41 (3.8%) subjects with pseudoneurological
Symptoms or deficits were found to have a medical or neurological disease. These diseases were, respectively, hypertension (9, 22.0%), herniated disk (7, 17.1%), vertigo (6, 14.6%), diabetes mellitus (4, 9.8%), epilepsy (3, 7.3%), essential tremor (3, 7.3%), migraine (3, 7.3%), subacute combined degeneration (2, 4.9%), carpal tunnel syndrome (1, 2.4%), subjective tinnitus (1, 2.4%), cerebrovascular event (1, 2.4%), hyperthyroidism (1, 2.4%). Of the patients, 86.9% (53) were females, 33 were males. 22 patients were in the age range of 25-34, 16 were in the range of 15-24, 10 were in the range of 35-44, 9 were in the range of 45-54 and 4 were above the age of 55. 54.0% (33) of the patients had an education level of elementary or junior high school. 68.8% (42) of patients were married. Of the subclasses of FNSD, 40(65.6%) patients had fainting, 15(24.6%) – numbness/tingling, 14(23%) – spasm/torticollis/opistotonus, 14(23%) – dizziness, 11(18%) – weakness, 8(13.1%) – dysphagia, 8(13.1%) – tinnitus, 8(13.1%) – astasia, 8(13.1%) – tremor, 6(9.8%) – sensory loss and the rest had the other symptoms. Of the total patients, 77% (47) of patients with conversion disorder had no accompanying psychiatric diagnosis; 9.8% (6) had not otherwise specified (NOS) depressive disorder, 6.6% (4) had major depressive disorder, 4.9% (3) had dysthymic disorder and 1.6% (1) had posttraumatic stress disorder. [5]

In another hospital based research which aimed to determine the comorbidities with conversion disorder and association with childhood trauma done in 2016, in Turkey, 60 female patients with FNSD participated, from which 72% (43) were married and 68%(38) were

primary school graduates. From the subtypes of symptoms all had asthenia, 58(97%) had aphasia, 56(93%) had crying convulsions, 55(92%) had numbness in extremities, 49(82%) had fainting/falling, 30(50%) had PNES and the rest had the other subtypes. Depression was found to be the commonest comorbidity 30(50%) of patients, dissociative disorders 29(48.3%), anxiety disorders 6(10%) and panic disorder 4(6.7%). Of the precipitants assessed, family conflict accounted for 43(71.7%) of patients followed by financial problems in 441(68.3%) of cases. [10]

A systematic review was undergone from 2000 – 2015 on different literatures on variables associated with coexisting epileptic and PNES in Brazil. This study included 9 studies of both prospective and retrospective methods. From the reviewed researches female gender predominated whereas comorbidities of somatoform disorder, other subtypes of conversion disorder and Cluster B personalities were more common in patients with PNES than in patients with PNES and epilepsy together. [12]

In a hospital based retrospective research done in Brazil in the time duration of 2006 – 2011, 102 patients with PNES were studied for demographic patterns, clinical and psychosocial characteristics of PNES. Of the total patients, 78(76.4%) were females, mean age of onset was found to be 27.85 years. Psychiatric comorbidities of depression - 48.03, anxiety – 27.45, substance use disorders – 9.8%, psychosis – 6.86%, and Bipolar disorder – 3.92%, cluster b personality disorders – 9.8% were found. 8(7.84%) of patients had attempted suicide. 35(34.31%) of patients had comorbid diagnosis of epilepsy. Precipitants were found in 59(57.84%) of patients. A stressful family environment was found in 16(15.68%) of patients, work related stressors in 10(9.8%), sexual abuse 6(5.88%), and physical abuse was found in 18(17.64%) of patients. [14]

In a cross sectional study undergone in Iraq with an objective of assessing the prevalence and risk factors of conversion disorder, 637 patients were selected randomly from an outpatient psychiatric clinic in Azandi Teaching hospital in the period of July 2008 – July 2009. Among the total patients 116(18.2%) were diagnosed with conversion disorder. Most patients were females 80.2% with a high significant statistical association between gender and conversion disorder ($P < 0.001$). 64.7% of the patients were in the ages of 18 – 25, which made age to have a statistically significant association with conversion disorder ($P < 0.001$). 36.2% of patients had primary school education and 30.2% were illiterate ($p = 0.014$). 51.7% were married and 46.6% were single ($p = 0.859$). 65 patients were from urban areas whereas 51 were from rural settings ($p = 0.603$). The commonest subtype of presentation was unresponsiveness – 49.1% followed by PNES – 21.6%, fainting attacks – 10.3%, abnormal movement – 8.6%, mutism – 4.3%, paralysis – 2.6%. Of the precipitants, domestic conflict accounted for 27.6%, love affair – 17.2%, illness – 13.8%, interpersonal problems – 10.3%, financial problem – 9.5%, academic problems – 8.6%, death of relatives – 6.9% and witnessing a traumatic incident – 6%. [18]

In a hospital based study in India with an objective of assessing the clinical presentation and relationship of sociodemographic variables with conversion disorder: 40 psychiatric patients who fulfilled the diagnostic criteria of conversion disorder and who were admitted at Asam Medical College and hospital over the period of November 2004 – August 2005 were studied. Majority of the patients 37(92.5%) were males, 23(57.5%) were in the age group of 18 – 29 years of age, 29(72.5%) were single, 17(42.5%) were from a rural setting. Of the subtypes of FNSD, motor symptoms were common 87.5% from which PNES accounted for 71.4%, paresis 17.1%, aphonia/dysphonia -20%, hyperventilation – 17.1%, dizziness – 14.3% and astasia abasia – 5.7%. No patients had sensory symptoms, whereas 7.5% had other symptoms of mixed dissociative disorder and ganser syndrome. The research also identified precipitants, the commonest being family related problems – 40% followed by school related problems – 30%. It also found that family related precipitating

factors had positive association with increasing age where as school related factors had negative associations with age. [17]

A record review and qualitative study done in Bangladesh in 2008 reviewed admission records from women's general medicine wards in two public hospitals to determine how often and at what point during hospitalization patients received diagnoses of hysterical conversion disorder. During the year, Hospital A admitted 2520 patients of which 171 (7%) were diagnosed with HCR. Whereas Hospital B admitted 5652 patients of which 277 (5%) were diagnosed with HCR. Median age of patients was 25 year, and the median length of hospital stay was 2 days for hospital A. 60% (267) patients retained the diagnosis of HCR up until discharge, the other 40% of patients had their diagnoses revised to or from a wide range of medical, psychiatric, and syndromic diagnoses. [8]

In an older retrospective study done in South Africa in 1982 which aimed to determine cultural and psychiatric aspects of conversion disorder in Zulu patients, 40 psychiatric inpatients treated over the years 1977 – 1980 and 23 outpatients treated in the year of 1980 were included. Mean age was found to be 22.5 years, 34 patients were from a rural setting whereas 29 from urban areas, most patients (n=32) were single. Again most patients (n=27) were either uneducated or had only primary education. From the total patients the following precipitants(primary gain) were found: psychological conflict involving family – 18 patients, school problems – 12, psychological conflict concerning relationship – 11, psychological conflict involving spouse – 9, pregnancy problems – 8, work problems – 4 and problems with neighbour – 1 patient were found. The research also identified secondary psychological gains of: attention from family members – 17 patients, avoidance of interpersonal conflict – 17, sick role – 10, avoidance of school – 9, avoidance of work – 44 and grief reaction in 4 patients. The different subtypes of FNSD found were: psychogenic pain – 15 patients, headaches – 6, fainting attacks – 6, dizziness – 5, crying attacks – 4, difficulty in breathing – 4, meaningless speech – 2, palpitation – 2 and cough in 1 patient. [16]

In another descriptive study done in South Africa in 2014 over 9months period, 22 patients with video EEG confirmed PNES were selected by convenience sampling from the general neurologic clinic. From the total patients 77% were females and the mean age was 32.77 years, 45% were single, 50% married and 5% divorced. 50% of patients' educational level was below 12^{th} grade. 68% had comorbid epilepsy diagnosis, whereas 27% had comorbid psychiatric diagnosis. [15]

A hospital based cross sectional study in Tanzania was conducted with an objective of determining the prevalence, epidemiology and clinical phenotype of FNSD and PNES in a referral hospital over a 6 year period (2007 to 2013). In the study a total of 2040 neurologic patients participated who attended outpatient clinics and admitted to wards. Of the total evaluated patients 44(2.2%) were diagnosed with FNSD. From those, 68% were females and 32% males. And majority 21(48%) were less than 20 years of age. The commonest clinical presentation was PNES of 22(50%) of total FNSD patients followed by inability to walk 9(20.5%), functional movement disorder 6(13.6%), stroke like presentation 4(9.1%), loss of vision 2(4.5%) and confusion/coma 1(2.3%). Of the PNES patients 14(63%) were females and 18(82%) were less an age of 30. [6]

In a retrospective descriptive study done in Sudan, Khartoum Neuropsychiatric center over the period of December 2014 – December 2015, a total of 1000 patients were seen from which 40 patients fulfilled the criteria for FNSD. 25(62.5%) were referred by neurologists and senior physicians, 15(37.5%) by miscellaneous sources. Of the total patients, 24(60%) were females, 80% were below the age of 25 years, 87.5% were of low socioeconomic status, 72.5% were single. The commonest presentation was PNES – 82.5% followed by motor weakness – 35%, abnormal gait – 12.5%, speech impairment – 47.5%. 97.5% of patients showed mood disorder symptoms (insomnia and hypersomnia). 50% of patients presented with in three months of the onset of illness. Of the investigation results, 92.5% had normal full blood tests, 95% had normal EEG, and of the 31 patients who had MRI 28 had normal findings.

20(50%) of patients reported stressors of bereavement, academic issues and relationship breakups. [19]

4 Methods

4.1 Study Design

The study was a retrospective cross sectional electronic medical record review to describe the prevalence and associated factors of FNSD among patients who visited the outpatient clinic of psychiatry in Tikur Anbessa Specialized Hospital in the duration of (Hamle 1/2011 to Hamle 30/2013 E.C).

4.2 Study Setting

The study was conducted at Tikur Anbessa Specialized Hospital, Addis Ababa. Tikur Anbessa Specialized Hospital is the teaching hospital of the College of Health Sciences, Addis Ababa University. TASH is the largest specialized hospital in Ethiopia, with over 700 beds, and serves as a training center for undergraduate and postgraduate medical students, dentists, nurses, midwives, pharmacists, medical laboratory technologists and radiology technologists. Department of psychiatry is one of the departments in the hospital with a post graduate training in psychiatry, clinical psychology and it also gives clinical services in an outpatient clinic comprising of 5 OPD rooms. The service is given by psychiatrists, clinical psychologists, psychiatry residents and clinical psychology students.

4.3 Study Period

The patients attending the psychiatric Outpatient clinic during the period of two years from Hamle 1/2011 to Hamle 30/2013 E.C were included in the study.

The specific time period was chosen considering the timeline of the yearly research schedule and for it to be near to the data analysis period.

4.4 Study population

Source population included all patients who come to TASH psychiatry outpatient clinic and the study population included the patients who came to the outpatient psychiatric clinic and those referred from other departments during the time period of Hamle 1/2011 – Hamle 30/2013 E.C.

4.4 Inclusion and Exclusion criteria

Inclusion Criteria

• All patients (Both adult and pediatric age group) who attended the outpatient clinic in the period of Hamle 1/2011 – Hamle 30/2013 E.C were included in the study.

Exclusion Criteria

• Patients who attended the outpatient clinic before or after the study period were excluded from the study.

4.5 Sampling Technique

The diagnosis of all patients who attended the psychiatric clinic in the duration of Hamle 1/2011 – Hamle 30/2013 E.C was reviewed from the HMIS record book. The electronic medical record of all patients who were diagnosed with FNSD was retrieved and the details of their presentation and associated factors were extracted.

4.6 Variables in the study

Independent Variables: Age, sex, educational status, religion, address, occupation, and marital status, precipitants, duration of presentation, comorbid psychiatric and neurologic illnesses, investigations.

Dependent Variables: FNSD and its subtypes.

Data Collection

The health management information system (HMIS) was used to get the electronic ID number of patients in the specified duration period.
The record of all patients diagnosed by psychiatry residents and psychiatrists as FNSD was evaluated. From the psychiatric history sociodemographic factors (sex, age, occupation, marital status) and clinical factors (precipitants, duration of presentation and comorbidities) were extracted.

4.7 Data Collection Tool

Data extraction tool was developed to extract all the relevant information (**please see annex**). The tool contains data on sociodemographic factors, DSM 5 diagnoses and different associated factors (duration of illness, precipitants, comorbid psychiatric, medical and neurologic disorders) from the electronic medical record of each patient.

4.8 Data Analysis

The Data was entered and analysed using the statistical package for the social sciences (SPSS) version 20. Descriptive analysis (frequencies, percentages, and means with standard deviation (SD)) were used to present the prevalence, sociodemographic and clinical characteristics. Univariable then multivariable logistic regression were used to determine the factors associated with FNSD. Univariable logistic regression was done by including the relevant and hypothesized sociodemographic

variables. All factors with significant P value (P<0.05) were entered to multiple logistic regression.

4.9 Operational Definition

Traumatic Experiences: Exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways: Directly experiencing the traumatic event, Witnessing, in person, the event as it occurred to others, Learning that the traumatic event occurred to a close family member or close friend: In cases of actual or threatened death of a family member or friend, the event must have been violent or accidental, Experiencing repeated or extreme exposure to aversive details of the traumatic event. [20]

Childhood adversities: refer to negative environmental experiences (such as exposure to violence, abuse, neglect, separation from caregivers, and chronic poverty) that are likely to require significant adaptation by an average child and that represent a deviation from the expectable environment. [21]

5 Ethical Consideration

Ethical permission was sought from the Department of Psychiatry, College of Health Sciences, Addis Ababa University. The data extraction tool was anonymised by giving it a unique identification number and this number was linked to the patient's electronic ID number only. Confidentiality was maintained by keeping the extracted data in a safe place.

6 Results

There were a total of 2089 patients seen from the time of from Hamle 1/2011 – Hamle 30/2013 E.C, from these 759(36.3%) patients were new and 1330(63.7%) were repeats. From the total patients 105(46-new, 59-repeat) were diagnosed with conversion disorder making its prevalence 5.02% and incidence 2.20%.

The other diagnoses includes neurodevelopmental disorders, schizophrenia spectrum and psychotic related disorders, depressive disorders, Bipolar and related disorders, anxiety spectrum disorders, OCD and related disorders, and the rest of the major DSM 5 diagnoses.

6.1 Socio-demographic characteristics

The age distribution of patients with conversion disorder is seen on table 1. 67(63.8%) of patients were below the age of 20[57 were adolescents (age 10 - 19) and 9 were with age of less than 10 years], 29(27.6%) were in the age range of 20 to 40 and 9(8.6%) of the patients in the age range of 40 to 60. The mean age of presentation was 20 years with the standard deviation of 10 years.

Almost two thirds of the patients diagnosed with conversion disorder were females 72(68.6%) see **Table 1.**

Of the total pateints 70(66.7%) were from urban area, where as 35(33.3%) from rural area.

Half of the patients 56(53.3%) were in elementary school or educated up until elementary school, 22(21%) had a high school education and 19(18.1%) had a higher level of education.

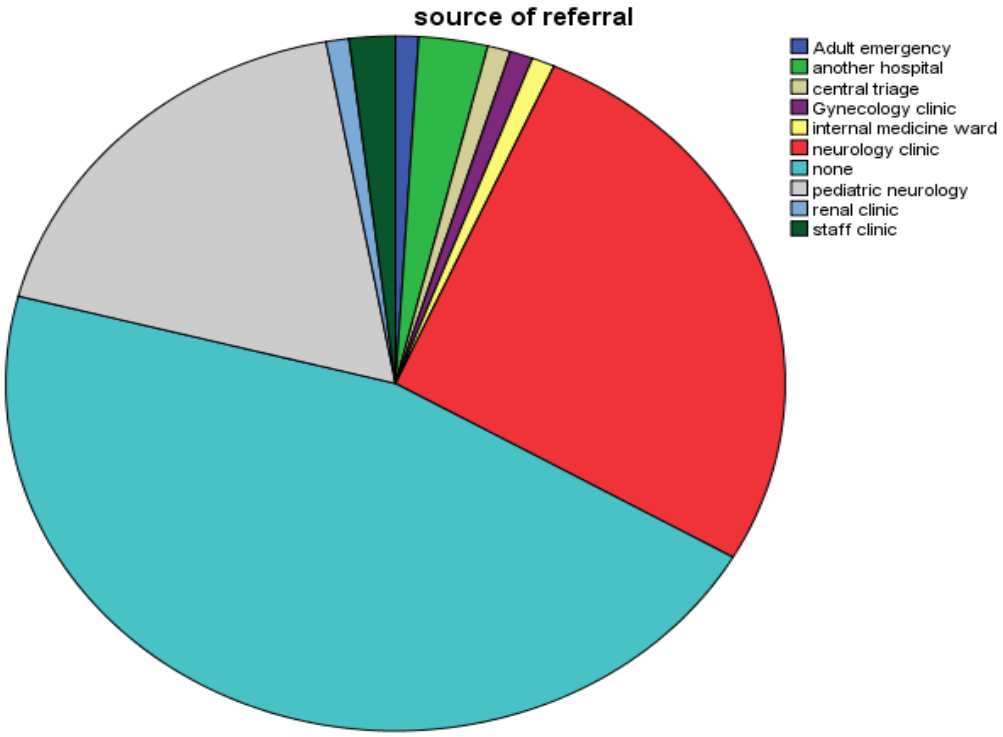
Concerning their occupational status the majority of patients 73(69.5%) were students, 21(20%) were unemployed whereas 11(10.5%) were employed.

From the total patients with conversion disorder half of them 53(50.5%) were followers of orthodox Christianity, 26(24.8%) were Muslims, 22(21%) were protestants and 4(3.8%) were Catholics.

Of the total patients most 89(84.8%) were single, 13(12.4%) were married, 2(1.9%) were divorced and only 1 patient was widowed.

6.2 Source of Referral of patients

From the total number of patients with conversion disorder almost half of them 48(45.7%) had no referral, 28(26.7%) were referred from adult neurology clinic, 19(18.1%) were referred from pediatric neurology clinic, 3(2.9%) were referred from another hospital, 2(1.9%) were referred from staff clinic, and there were patients who were referred from adult emergency(1), central triage (1), gynecology clinic(1), internal medicine ward(1) and renal clinic (1). **See pie chart 1**



Pie chart 1: source of referral of patients

Table 1: socio-demographic characteristics

Sociodemographic characteristics		Number (N)	Percent (%)
Gender	Female	72	68.6
	Male	33	31.4
Age	Below 20	67	63.8
	20 to 40	29	27.6
	40 to 60	9	8.6
Address	Urban	70	66.7
	Rural	35	33.3
Educational Status	No formal education	8	7.6
	Elementary school	56	53.3
	High school	22	21
	Higher level of education	19	18.1
Occupation	Unemployed	21	20
	Employed	11	10.5
	Student	73	69.5
Religion	Orthodox Christianity	53	50.5
	Muslim	26	24.8
	Protestant	22	21
	Catholic	4	3.8
Marital Status	Single	89	84.8
	Married	13	12.4

	Divorced	**2**	**1.9**
	Widowed	**1**	**1**

6.3 Description of clinical characteristics

6.3.1 Duration of presentation

Majority of the patients 48(45.7%) presented in less than 3 months of illness onset, 42(40%) presented in more than 6 months of onset and the rest 15(14.3%) presented in the duration of 3 to 6 months. **See Table 2**

6.3.2 Type of FNSD

Among the subtypes of functional neurologic symptom disorder; attack or seizure the commonest among the patients 72(68.6%), weakness or paralysis was seen on 10(9.5%) patients, 8(7.6%) patients had an abnormal movement as presentation, 7(6.7%) had mixed type of symptoms, 4(3.8%) of patients had types not classified under the main categories, two patients had speech symptoms, one patient had anesthesia or sensory loss, one patient had special sensory symptom. **See Table 2**

6.3.3 Psychiatric comorbidities

Among the total number of patients, 73(69.5%) had no psychiatric comorbidity, whereas the rest 32(30.5%) had comorbid psychiatric diagnosis. Among the psychiatric comorbidities MDD was seen in 14(13.3%) of the patients. The rest are described in **table 2**.

6.3.4 Neurologic comorbidities

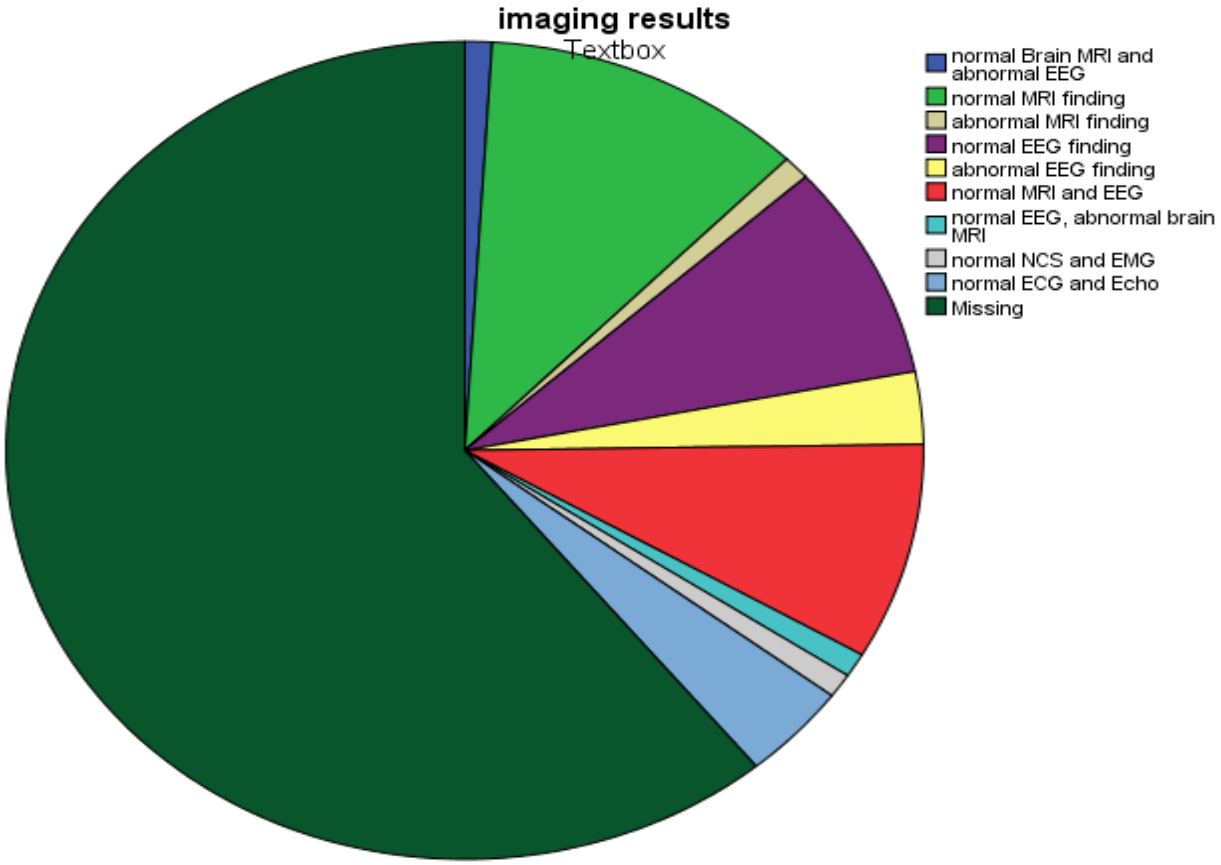
Among the total number of patients with conversion disorder, 83(79%) had no comorbid neurologic diagnosis whereas 22(21%) had a comorbid neurologic diagnosis from which epilepsy is the commonest seen in 13(12.4%) of patients. The rest are described in **table 2**.

6.3.5 Medical comorbidities

Among the total number of patients 85(81%) had no medical comorbidity whereas 20(19%) had additional medical diagnosis the commonest being Diabetes Mellitus seen in 5 patients. The rest are described in **table 2**

6.3.6 Investigation Results

From the total patients with conversion disorder (105), 62(59%) patients had no laboratory and imaging investigations. The rest 43(41%) had various kinds of investigation results. From the ones with investigation results, 15(14.3%) of patients had normal laboratory investigation results (including CBC, OFTs and serum electrolytes). Another 41(39%) patients had imaging results, from which the commonest being normal brain MRI finding seen in 12(11.4%) of patients. 9(8.6%) had normal EEG finding, 9(8.6%) had normal EEG and brain MRI finding, 4(3.8%) had normal ECG and Echo finding, 3(2.9%) had abnormal EEG finding, one patient had normal brain MRI and abnormal EEG finding, one patient had abnormal brain MRI finding, one patient had normal EEG and abnormal brain MRI finding, one patient had normal NCS and EMG finding. **Pie chart 2**



Pie chart 2: Patients with diagnosis of conversion disorder and had investigation result (N=43)

Table 2: Clinical characteristics

Clinical characteristics		Number (N)	Percent (%)
Duration of presentation	Less than 3 months	48	45.7
	3 to 6 months	15	14.3
	More than 6 months	42	40
Type of FNSD	Weakness or paralysis	10	9.5
	Abnormal movement	8	7.6
	Speech symptoms	2	1.9
	Attacks or seizures	72	68.6
	Anesthesia or sensory loss	1	1
	Special sensory symptoms	1	1
	Mixed symptoms	7	6.7
	other	4	3.8
Psychiatric comorbidities	Mood disorders	17	16.3
	Anxiety spectrum disorders	5	4.9
	Personality disorders	4	3.9
	Psychosomatic disorders	1	1

	Trauma and stressor related disorders	**5**	**4.8**
	OCD and related disorders	**1**	**1**
	Neurocognitive disorders	**1**	**1**
	No comorbidity	**73**	**69.5**
Neurologic comorbidities	**Epilepsy**	**18**	**17.4**
	Chronic lower back pain	**1**	**1**
	Peripheral neuropathy	**2**	**2**
	Parkinson's disease	**1**	**1**
	RVI associated CNS lesion	**1**	**1**
	No comorbidity	**83**	**79**
Medical comorbidity	**Diabetes Mellitus**	**5**	**4.9**
	Hypertension	**3**	**3**
	Cardiac Related	**3**	**3**
	Renal related	**3**	**3**
	RVI	**2**	**2**
	Pregnancy Related	**2**	**2**
	GI related	**1**	**1**
	Hypocalcaemia	**1**	**1**

	Gyne related	**3**	**3**
	No medical comorbidity	**85**	**81**

6.4 Presence of early childhood adversities and traumatic experiences

Among the patients with conversion disorder: majority 52(49.5%) had a missed data on childhood adversities, 46(43.8%) had no childhood adversities and 7(6.7%) had early childhood adversities. Among the ones with early childhood adversity, 2 had abusive parents, 2 had early parental loss, one had an abusive father, one had early parental divorce and one was abandoned by parents at an early age and was raised in an orphanage.

Concerning traumatic experiences 49(46.7%) patients had no prior traumatic experience to the onset of illness, 49(46.7%) patients had no record on the presence of traumatic experience and 7(6.7%) had history of prior traumatic experience. Among the patients with history of traumatic experience: 4(3.8%) were raped, 2(1.9%) sustained a road traffic accident and one patient witnessed a shoot down. **See Table 3**

6.5 Precipitants of illness

From the total number of patients with conversion disorder (105), majority 67(63.8%) had no identifiable precipitant whereas 38(36.2%) had stressors prior to their onset of illness. Among the precipitants familial conflict was the commonest, seen in 20(19%) of patients, death of a family member was seen in 6(5.7%) of patients, sustaining a traumatic incident was a precipitant in 4(3.8%) patients, birth of a new sibling and school related problems were seen in two patients each. Financial problems, interpersonal problems, illness of a family member and work related problems account for the rest of the percentage, 1% each. **See Table 3**

Table 3: Precipitants and Risk factors

Precipitants and Risk factors		Number (N)	Percent (%)
Early childhood adversities	Abusive parents	3	2.8
	Early parental loss	3	2.8
	Early parental divorce	1	1
	No adversity	46	43.8
	Missed data	52	49.5
Traumatic experiences	Rape	4	3.8
	Road traffic accident	2	1.9
	Witnessing a shoot down	1	1
	None	49	46.7
	Missed data	49	46.7
Precipitants	Familial conflict	20	19
	Death of a family member	6	5.7
	Traumatic incident	4	3.8
	Birth of a new sibling	2	1.85
	School related problems	2	1.85
	Financial problems	1	1
	Interpersonal problems	1	1
	Work related problems	1	1

	Illness of a family member	**1**	**1**
	None	**67**	**63.8**

6.6 Factors associated with conversion disorder

On a bivariate analysis it was found that age, gender and residency were strongly associated with the diagnosis of FNSD compared to the other psychiatric diagnoses. **See table 4.** After adjustment for sex, age and residency on multivariable logistic regression age groups in a range of 20 to 40 years (Adj. OR= 0.33, 95% CI 0.21 0.53) and those in a range of 40 to 60 years (Adj. OR= 0.23, 95% CI 0.11 0.48) had a lesser odds of being diagnosed with FNSD than patients in the age range of less than 20 years. Female patients (Adj. OR= 2.49, 95% CI 1.59 3.91) and urban dwellers (Adj. OR= 3.17, 95% CI 1.95 5.14) were found to have higher odds of being diagnosed with FNSD.

Table 4: Bivariate analysis factors associated with FNSD

		Odds ratio	P-value	95%conf. interval
Age (years)	**Below 20**	**1**		**1**
	20 to 40	**0.34**	**<0.001**	**0.21 0.54**
	40 to 60	**0.24**	**<0.001**	**0.12 0.52**
Sex	**Male**	**1**		**1**
	Female	**2.32**	**<0.001**	**1.51 3.570**
Residency	**Rural**	**0.32**	**<0.001**	**0.19 0.51**
	Urban	**2.68**	**<0.001**	**1.70 4.21**

Table 5: Factors associated with a diagnosis of FNSD in patients seen at psychiatry OPD of BLH

Characteristics		Adjusted OR	P value	95% confidence interval
Age (years)	Below 20	1		1
	20 to 40	0.33	<0.001	0.21 0.53
	40 to 60	0.23	<0.001	0.11 0.48
Sex	Male	1		1
	Female	2.49	<0.001	1.59 3.91
Residency	Rural	1		1
	Urban	3.17	<0.001	1.95 5.14

7 Discussion

A retrospective medical record review was done on patients seen in TASH, psychiatric OPD. The study found that the prevalence of FNSD to be 5.02% which is comparable to different researches done in a similar setup. FNSD was more commonly seen in the age group of less than 20, females, urban dwellers, single, students of elementary school or individuals who were only educated till elementary school and in patients of orthodox Christianity religion. Most of the patients had no referral prior to their presentation to the OPD.

Most of the patients presented in less than three months of illness and the record of patients having early childhood adversities and prior traumatic experiences was found to be very low. Again majority of the patients had no identifiable precipitant prior to the onset of their illness, whereas from the identified precipitants familial conflict was the commonest and similar results were also seen in the other literatures.

Among the different subtypes of FNSD, more than half of the patients had attacks or seizures, which is similar to most of the other researches. Concerning comorbidities, psychiatric, neurologic and medical comorbidities weren't commonly seen. Among the psychiatric comorbidities, mood disorders were the commonest and from the neurologic comorbidities epilepsy was found to be most prevalent. Most of the patients had no laboratory and imaging results. Among the ones who had, negative results were prevalent.

In this study, there were a total of 2089 patients seen from the time of from Hamle 1/2011 – Hamle 30/2013. From the total seen patients 105 were diagnosed with conversion disorder making its prevalence 5.02% and incidence 2.20%. The prevalence is comparable to a study done in the US at a tertiary health care, 5% (7). Whereas according to a study done in Sudan with a similar setting the prevalence was found to be lesser, 0.4% (19) and in a study in Iraq with a similar setting a higher prevalence was seen, 18.2% (18). A higher prevalence was seen in the other studies with different setups. (4, 8)

Seeing the age distribution in this study, most patients (63.8%) were below the age of 20 which was not similarly seen in other studies at different parts of the world (14, 6, 5, 4). In this study, functional neurologic symptom disorder was prevalent in females (68.6%), urban dwellers (66.7%), in single patients (84.8%) and majority were students (69.5%) and educated up to elementary school or in elementary school. (53.3%) This could be explained by the common age of presentation of less than 20 years. Similar distribution of gender, education and residency were seen in a study done in Iraq (18). Where as a study in India showed a higher prevalence in males unlike our result (17). Among the patients most of them had no referral whereas 26.7% and 18.4% were referred from adult and pediatric neurology clinics respectively. In a study done in Sudan and USA similar finding was gotten whereas most patients were referred from neurology clinics. (19, 11)

In our study, the mean duration of presentation was less than three months (45.7%) which is a close finding by a study done Australia, the commonest duration being less than 6 months (4). The commonest subtype of functional neurological symptom disorder was found to be attack or seizure (68.6%) followed by weakness or paralysis (9.5%). In similar studies done worldwide psychogenic non-epileptic seizure was found to be the commonest subtype of presentation (9, 18, 17, 6, 19). Where as in study done in Australia the second common presentation in our study was found to be the commonest. (4)

Concerning precipitants and different risk factors, the majority of patients had no identifiable precipitants (63.8%) unlike the other studies probably due to lack of exploration, among the precipitants familial conflict was seen in 19% of patients. Other risk factors studied were early childhood adversities (seen in 6.7% of patients) and traumatic experiences (seen in 6.7%) of the patients. A study done in the US found that there were associations between child hood sexual and physical abuse with psychogenic non-epileptic seizures (11). In a research done in Brazil, precipitants were found in 57.8% of patients the commonest being a stressful family environment which was also seen in our study (14). Other

studies done in Iraq and South Africa showed domestic/familial conflict to be the commonest precipitant. (18, 16)

In studies done in Norway, Brazil and Turkey among the psychiatric comorbidities, depression was found to be most prevalent which was also seen in our study 13.3% and in general mood spectrum disorders (16.3%) (5, 1, 14, 10). Whereas a study in the US showed that somatization disorder is the commonest psychiatric comorbidity. (7) A study done in Turkey found hypertension as the commonest among the medical and neurological comorbidities (5). According to a Study in South Africa, the commonest neurologic comorbidity associated with FNSD was found to be Epilepsy similar to our study's result of epilepsy comorbidity in 17.4% of cases. (15)

In this study, only 43(41%) cases had different investigation results, the lesser number of cases with investigation results when compared to the other studies could be attributed to non -availability of different investigation modalities and lack of documentation too. From the ones with investigation results, 15(14.3%) of patients had normal laboratory investigation results. Another 41(39%) patients had imaging results, from which the commonest being normal brain MRI finding seen in 12(11.4%) of patients, 9(8.6%) had normal EEG finding which showed a lesser number of case investigations than in a study in Sudan (19). Similarly, in another study done in Australia, a higher number of cases had neuroimaging (71%) and neurophysiological (49%) investigations unlike our study which could be associated with a lower detection rate. (4)

In our study statistically significant association was seen between the diagnosis of FNSD and female gender, age range of less than 20 and urban residency compared to people diagnosed with other psychiatric diagnosis in Univariable and multivariable analysis. This study has also found supportive evidence for the proposed hypothesis. In a study done Iraq it was similarly found that gender and age had statistically significant association with FNSD yet residency didn't show any significant association. (18)

8 Conclusion

The sociodemographic characteristics results from our study are comparable to other studies form a similar setup, and so are the clinical characteristics. Significant association was seen between age, gender and area of residency and diagnosis of FNSD. From the study it was found that specific clinical characteristics lacked documentation and majority of patients with FNSD weren't investigated which warrants further area of focus.

9. Recommendation

- Since this study is one of its kind in our set up, we hope that it will shade a light to further large scale prospective and qualitative researches in the future.

- There were multiple missing data concerning clinical characteristics of history of traumatic experiences and early childhood adversities, so we recommend through evaluation of patients and proper documentation of findings.

- In the study it was also found that more than half of the patients weren't investigated properly, it's important to have the proper investigations apart from the clinical judgement in diagnosing FNSD.

9 Limitations

- The study used a retrospective cross sectional electronic medical record review in which all patients with the diagnosis of FNSD who attended the OPD in the time duration of Hamle/2011 to Hamle 30/2013 E.C were included. The clinical setting of the study and the small number of data makes the study difficult to be generalized to a whole population or non-clinical settings.

- Similarly, the study design was prone to be affected by poor medical record keeping which in turn affected the results gained from it.

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Annex

Data extraction tool

1. Date: dd…../mm……/year……
2. Identification data:
   - 2.1. I care number: ……
   - 2.2. New …… follow up ……
   - 2.3. If referred, source of referral……
   - 2.4. Age:
     - below 20
     - 20 – 40
     - 40 – 60
     - Above 60
   - 2.5. Sex:
     - Female
     - Male
   - 2.6. Address:
     - Urban
     - Rural
   - 2.7. Formal education: yes….. No ……
     If yes:
     - Elementary
     - High school
     - Higher level education
   - 2.8. Occupation: ……
   - 2.9. Religion:
     - Orthodox Christian
     - Muslim
     - Protestant
     - Other
   - 2.10. Marital status:
     - Single
     - Married
     - Divorced
     - Widowed
3. Duration of presentation: ……..

4. History of childhood adversities: yes…….. No ……
   If yes, specify: ……..

5. History of traumatic experiences: yes ……. No ……..
   If yes, specify: ……..

6. Precipitants: yes …. No …..
   If yes, specify: ……

7. Which subtype of FNSD is Present:

   - Weakness or paralysis:
   - Abnormal movement:
   - Swallowing symptoms:
   - Speech symptom:
   - Attacks or seizures:
   - Anesthesia or sensory loss:
   - Special sensory symptom:
   - Mixed symptoms:
   - Other:

8. Comorbid psychiatric illness: yes: …… No: ……
   If yes, specify: ……

9. Comorbid neurological illness: yes …….. No …….
   If yes, specify: ……

10. Comorbid Medical illness: yes …… No ……..
    If yes, specify: ……..

11. Investigation results: yes …… No ……..
    If yes,

- Laboratory investigations: ……
- Imaging results: ……