Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Neurophyscian

Prevalence and Pattern of Various Neurological Disorders in Urban and Rural Areas: A Social economic Study

Imran Ullah[1], Aysha zafar [2], Hanif Ur Rahman[3*], Muhammad Arif Khan [4], Zia Ullah[5], Fawad Ali[6]

[1]Consultant Neurosurgeon Saidu hospital Swat. Pakistan
[2] Assistant Prof Neurologist Lrh Hospital Peshawar, Pakistan
[3]Consultant Neurosurgeon Prime hospital Peshawar Pakistan
[4]Consultant Medical specialist dhq Hospital swabi Pakistan
[5]Consultant Neurologist dhq Hospital timgergira lower dir Pakistan
[6] Consultant Neurologist saidu teaching hospital swat Pakistan

DOI: 10.36347/sjams.2022.v10i03.024 | **Received:** 26.02.2022 | **Accepted:** 21.03.2022 | **Published:** 31.03.202

***Corresponding author:** Aysha zafar , zia ullah
[2]Assistant Prof Neurologist Lrh Hospital Peshawar. Pakistan
[5] Consultant Neurologist dhq hospital Timergira lower dir Pakistan

Abstract **Original Research Article**

Introduction: Neurological disorders are problems that affect the brain, as well as the nerves that run throughout the body and the spinal cord. Underlying metabolic or electrical abnormalities in the brain, spinal cord, or other nerves can have a wide range of negative consequences. ***Aim of the study***: This study examined at the prevalence and pattern of various neurological disorders in urban and rural areas of kpk Pakistan a Socio-Economical study . ***Methodology*:** The study was carried out in the Department of Neurology Lrh Hospital Peshawar Pakistan . On the urban and rural populations of the KPK district of Peshawar. In a two-phase design, each area received a proportional representation in sample size allocation, and the probability proportional to size (PPS) technique was applied. An individual's case of neurological illness was only confirmed after a professional evaluation. A total of 260 patients (out of 1800 samples) tested positive for neurological diseases, yielding a 2.6 percent crude prevalence. The crude frequency in rural regions was 2.28 percent, whereas it was 5.4 percent in urban areas. Migraine was the most common disorder. ***Conclusion*:** Given the increasing occurrence of serious neurological illnesses, there is a need for healthcare personnel to be trained in their treatment.

Keywords: Prevalence , Neurological disorders, urben and rural , social economic study

INTRODUCTION

Psychological problems are common comorbidities of nervous system diseases, [1] and they have a lot in common in terms of risk factors and pathophysiology. Nonetheless, neurologists can effectively ignore mental diseases.[2,3] The systems underlying the link between mental problems and neurological disease are very convoluted. This Research Topic covers a wide range of studies on post-stroke depression and anxiety, intellectual disability, and depression in Creutzfeldt-Jakob and Parkinson's disease. The nervous system is made up of the brain, spinal cord, and nerves. They control all of the body's processes when they work together. When something goes wrong with a part of your nervous system, you may have difficulties moving, talking, or gulping., either breathing or learning You may also experience troubles with your memory, detects, or mindset.[4,5]

There are over 600 neurologic illnesses. Significant types include of Diseases caused by faulty genes, such as Huntington's disease and muscular dystrophy. Spina bifida is a condition that affects the way the neural system develops. Degenerative disorders, such as Parkinson's and Alzheimer's, in which nerve cells are damaged or die. Stroke is an example of a disease of the veins that supply the brain. Wounds to the spinal cord and the brain Seizure disorders, similar to epilepsy, Brain tumours, for example, are examples of cancer.[6] Brain growths

disorders, such as meningitis, are examples of malignancy.[7]

Neurological disorders are restoratively characterized as disorders that influence the brain just as the nerves found all through the human body and the spinal cord. Underlying, biochemical or electrical irregularities in the brain, spinal line or different nerves can bring about a scope of side effects.[8,9] Instances of indications incorporate loss of motion, muscle shortcoming, helpless coordination, and loss of sensation, seizures, disarray, torment and modified degrees of cognizance. The particular reasons for neurological issues differ, yet can incorporate genetic disorders, inborn anomalies or disorders, contaminations, way of life or environmental medical issues including un-healthiness, and brain injury, spinal string injury or nerve injury.[10,11] There are many perceived neurological disorders, some moderately normal, yet numerous uncommon. Mental disorders, then again, are "mental sicknesses" or diseases which show up principally as anomalies of suspected, feeling or conduct, delivering either pain or impedance of capacity. As per the U.S. Public Library of Medicine there are in excess of 600 neurologic diseases.

Neurological inabilities incorporate a wide scope of disorders, like epilepsy, learning handicaps, neuromuscular disorders, mental imbalance, ADD, brain growths, and cerebral paralysis, just to give some examples. Some neurological conditions are inherent, arising before birth. Different conditions might be brought about by cancers, degeneration, injury, diseases or primary deformities. Despite the reason, all neurological handicaps result from harm to the nervous system.[12] Contingent upon where the harm happens, decides how much correspondence, vision, hearing, development and perception are affected.[13,14] Neurological disorders incorporate epilepsy, neuro-infections (bacterial and viral), brain cancers, cerebrovascular diseases, Alzheimer disease and different dementias, headache and other migraine disorders, various sclerosis, PD, and traumatic disorders because of head injury. Numerous viral (i.e., enteroviruses, human immunodeficiency infection, West Nile Virus, and Zika), bacterial (i.e., Neisseria meningitidis and Mycobacterium tuberculosis), contagious (i.e., Aspergillus and Cryptococcus), and parasitic (i.e., Malaria and Chagas) diseases can influence the nervous system. Figure shows the detailed general most normal classification of neurological disorders.[15,16]

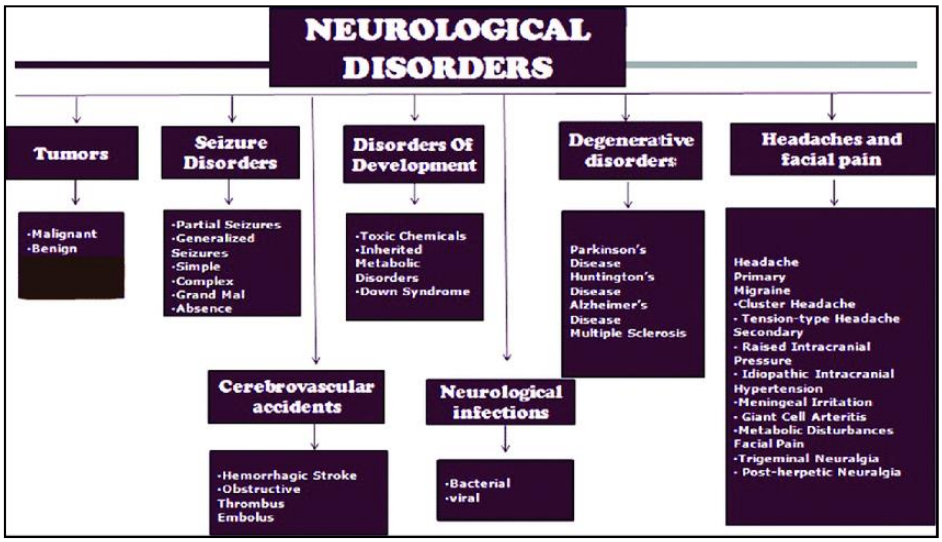

Fig-1: Classification of neurological disorders

Signs and symptoms of nervous system disorders

Coming up next are the most well-known general signs and indications of a nervous system issue. Notwithstanding, every individual might encounter side effects in an unexpected way. Side effects might include:

- Tireless or unexpected beginning of a cerebral pain
- A migraine that changes or is unique
- Loss of feeling or shivering
- Shortcoming or loss of muscle strength
- Loss of sight or twofold vision
- Memory misfortune
- Debilitated mental capacity
- Absence of coordination
- Muscle unbending nature
- Quakes and seizures
- Back torment which transmits to the feet, toes, or different pieces of the body
- Muscle squandering and slurred discourse
- New dialect debilitation (articulation or perception)

The indications of a nervous system issue might look like other ailments or issues. Continuously see your medical services supplier for a determination.

Diagnosis and Screening for Neurological Conditions

At the point when specialists speculate somebody has a neurologic condition, for example, brain injury, growths, hydrocephalus, aneurysm, epilepsy or stroke, a scope of neurologic tests can assist with deciding the finding. A radiologist or technologist regulates the test and afterward sends the outcomes to the specialist. For example, an arteriogram (or angiogram) can make veins, corridors and different constructions more apparent and can uncover blockages, mutations, aneurysms or different issues influencing the veins of the brain and spine.

Figured tomography or CT scan, catches cross-sectional perspectives on the brain and encompassing designs. Figured tomography angiography (CTA) joins a CT examine with an infusion of a difference medium to deliver pictures of veins and tissues.

Electroencephalograms, or EEGs, record the electrical movement of the brain and are important for the analytic work-up for epilepsy and different disorders.

Attractive reverberation imaging (MRI) utilizes radiofrequencies, amazing magnets and a PC interface to give an unmistakable and definite perspective on delicate tissue and organs in the body, including the brain. Extraordinary utilizations of attractive reverberation imaging incorporate attractive reverberation angiography (MRA) and attractive reverberation venography (MRV).

Positron emanation tomography (PET) is an atomic medication imaging procedure that shows the design and capacity of the brain, alongside unpretentious changes in cell action seen at the beginning of specific diseases, like malignancy.

Healthcare providers who treat nervous system disorders

The most ideal approach to oversee nervous system disorders is with the assistance of a group of medical care suppliers. You may not require all individuals from the group at some random time. However, it's great to know what their identity is and how they can help. Here is a rundown of a portion of the medical care suppliers that might be associated with treating nervous system disorders:

- **Nervous system specialist.** The clinical medical care suppliers who analyze and treat nervous system disorders are called neurologists. A few neurologists treat intense strokes and cerebral aneurysms utilizing endovascular procedures.
- **Neurosurgeon.** Specialists who work as a treatment group for nervous system disorders are called neurological specialists or neurosurgeons.
- **Neuroradiologist and interventional radiologist.** This is a radiologist who works in diagnosing nervous system conditions utilizing imaging and in treating nervous system conditions like cerebral aneurysms, intense strokes, and vertebral breaks. This supplier likewise does biopsies of specific cancers.
- **Clinician.** Passionate issues like tension, depression, disposition swings, and peevishness are normal in nervous system disorders. Your clinician can help. Clinicians might do testing to discover how much your problem is influencing the manner in which you think and feel. Analysts likewise talk treatment (directing) to assist you with managing the enthusiastic impacts brought about by nervous system disorders.
- **Specialist.** Like your therapist, this colleague manages passionate and conduct manifestations brought about by nervous system disorders. By and large, talk treatment turns out best for these issues. Yet, on the off chance that you need meds to treat manifestations like depression or uneasiness, this specialist can help.
- **Physiatrist.** Medical care suppliers who work with individuals in the recovery (restoration) measure are called physiatrists.
- **Actual specialist.** This is a development expert who can assist you with moving and walk well. In active recuperation, you can likewise chip away at difficult or hardened muscles and joints.
- **Word related specialist**. This supplier assists you with figuring out how to deal with your everyday exercises. For instance, you may experience difficulty finishing assignments you need to accomplish at work or at home. Your word related specialist will assist you with discovering approaches to conform to any progressions in your actual capacities.
- **Speech/language pathologist.** This supplier represents considerable authority in correspondence, including intellectual correspondence. They likewise analyze and treat gulping issues.

METHODOLOGY

This study was conducted in Peshawar's kpk district, which included both urban and rural residents. The rural population was drawn from two health blocks in Peshawar district, kpk, while Peshawar town, with its 9 wards and slum population, served as the urban population study area. As a result, every area received a proportional representation in sample size allocation using the probability proportional to size (PPS) method, which is commonly used in large community-based research.

Population of the study

The study's source population consisted of all residents (over the age of one year) of the study area. The research was carried out over a one-year period beginning in June 2018 to june 2019. The sampling sites yielded a total sample size of 260 sample size.

This sample assisted us in determining the true prevalence of neurological disorders, as previously demonstrated by community-based studies on neurological disorders in Pakistan.

The following aspects were taken into account when determining the desired sample size:
• A sample of 260 people was chosen from urban wards, taking into account the population representation in rural and urban areas (90 percent vs. 10%).
• The remaining 106 samples were taken from Peshawar's two rural field practise areas.

DATA COLLECTION

The data was collected from both primary and secondary sources. Through an interview and a survey. In addition, SPSS 2.4 was used to calculate sample size and generate demographic charts in this study

To identify people eligible for inclusion in a study, a house-to-house survey was done. The study included all eligible people who were prevalent in their homes on the day of the survey and gave their consent to participate. Using the sampling technique described above, a total of 260 people were identified for the context of this research from selected geographical locations. The interviews took place in the participants' homes, and they were inquired to provide informed written consent. In the event of incapacity to consent or in the case of children under the age of 18, next of kin were asked to provide written consent. For children over the age of 7, a consent/assent form was completed.

Clinical assessment and diagnosis

All people who tested positive on the NIMHANS screen were regarded to have a neurological disorder and were assessed for a clinical diagnosis. Moreover, 10% of those who tested negative on the screen were clinically assessed. The process for selecting these 10% of people for clinical evaluation was similar to that used to screen for the existence of neurological disorders. A neurologist conducted the clinical evaluation. The participants were tested for the major neurological disorders listed below:

1. Stroke
2. Epilepsy
3. Dementia
4. Parkinsonism
5. Headache
6. Multiple Sclerosis
7. Cerebral Palsy

Only when a clinical assessment was a person's case of neurological disorder confirmed.

Sampling Design

- **Rural area**

A sample of 206 people from the countryside was chosen using a two-stage survey approach based on the principle of probability proportional to size.

- **Urban area**

Following the principle of probability proportional to size, 54 individuals were chosen from the city. The procedure was similar to that used in the rural area.

- **Sample size**

A total of 260 people (out of 1800 studied) tested positive for neurological disorders, resulting in a crude prevalence of 2.6 percent. The crude prevalence in rural areas was 2.28 percent, while the crude prevalence in urban areas was 5.4 percent. The most common disorder was migraine

Following the assignment of the population to be studied, households were systematically chosen to fill the allocated sample size.

Table-1: Urban and Rural Prevalence of Neurological disorders (%)

Neurological disorders	Rural	Urban	Total
Migraine	118	27	145
Epilepsy	36	10	46
Stroke	32	6	38
CerebralPalsy	7	3	10
Parkinsonism	3	2	5
Dementia	3	2	5
Others	7	4	11
All disorders taken together	206	54	260

DATA ANALYSIS AND RESULT

The mean age of the 260 people screened during the first phase was 34.96 years (SD± 20.88) in the rural area and 35.86 years (SD±19.95) in the urban area. The gender distribution in the sample population was nearly equal. Individual people from rural areas comprised 63.48 percent of the lower middle class, while individual people from urban areas comprised 69.5 percent of the upper middle class. A total of 260 people (out of 1800 did study) tested positive for neurological disorders, resulting in a crude prevalence

of 2.6 percent. The crude prevalence in rural areas was 2.28 percent, while the crude prevalence in urban areas was 5.4 percent. Migraine was the most common disorder in both rural and urban areas, with respectively, indicating a 1.3 percent prevalence among rural people and a 2.6 percent prevalence among urban people. The overall prevalence of migraine was (1.43 percent people). The overall prevalence of epilepsy was (0.48 percent), with (0.41 percent) in the rural population and (1.1 percent) in the urban population. Myasthenia gravis, Cerebralpalsy, brain tumour, LSMMC, Down's syndrome, and mental retardation were among the other neurological disorders identified.

Table-2: Neurological Disorders prevalence according to the Age (%)

Neurological disorders	Rural		Urban	
	<7 years	>7 years	<7 years	>7 years
Migraine	0	1.3	0	2.6
Epilepsy	0.01	0.4	0.1	1.0
Stroke	0	0.36	0	0.7
CP	0.01	0.07	0	0.3
Parkinsonism	0	0.02	0	0.2
Dementia >5Years	0	0.03	0	0.1
Others	0	0.06	0	0.4

Table 2 displays the age distribution of neurological disorders in the population. Migraine was discovered to be the most common disorder among people aged 7 and up, with a prevalence of (1.3 percent) in the rural population and (2.6 percent) in the urban population. In the study population, no migraine cases were found below the age of seven. Epilepsy and stroke were the next most common disorders in people aged 7 and up, with prevalence rates of (0.4 percent) and (0.36 percent) in the rural population, and (1.0 percent) and (0.7 percent) in the urban population, respectively. Only one patient with epilepsy was found in each of the rural and urban populations under the age of seven, whereas no patient with stroke was found in either the rural or urban populations.

Table-3: Neurological Disorders prevalence according to the gender (%)

Neurological disorders	Rural		Urban	
	Male	Female	Male	Female
Migraine	0.33%	0.96%	0.2%	2.4%
Epilepsy	0.25%	0.15%	0.9%	0.2%
Stroke	0.25%	0.11%	0.4%	0.3%
CerebralPalsy	0.02%	0.6%	0.3%	0.0%
Parkinsonism	0.01%	0.01%	0.1%	0.1%
Dementia >5Years	0.02%	0.01%	0.1%	0.0%
Others	0.03%	0.03%	0.2%	0.2%

Table 3 shows the gender-specific prevalence of neurological disorders in the study population. The prevalence of migraine was found to be higher in the rural population among females (0.96 percent) than males (0.33 percent); however, epilepsy (0.25 percent) and stroke (0.25 percent) were higher among rural males than females. The prevalence of dementia and other disorders was found to be nearly identical in both genders. Cerebral palsy was more common in rural females, with a prevalence of (0.6 percent), whereas Parkinsonism was the same (0.01 percent) in both genders. Migraine was more common in females (2.4 percent) than males in the urban population (0.2 percent). Males had a higher rate of epilepsy and stroke (0.1% and 0.4%, respectively) than females. There were (0.3 percent) cerebral palsy patients among males, but no cerebral palsy patients were found among urban females. The prevalence of parkinsonism was the same in males and females; however, dementia was found (0.1 percent) of urban males but not in urban females. The prevalence of other disorders was found to be in both sexes (0.2 percent).

Table-4: Neurological Disorders prevalence according to the socioeconomic status in rural population (%)

Neurological disorders	Class III	Class IV
Migraine	0.86	0.43
Epilepsy	0.24	0.16
Stroke	0.23	0.13
CerebralPalsy	0.06	0.02
Parkinsonism	0	0.02
Dementia >5 Years	0.03	0
Others	0.04	1

Table 4 shows the socioeconomic status-based prevalence of neurological disorders in the rural population. Migraine was most common in the rural population among the lower middle class (0.86 percent) and the upper lower class (0.43 percent). There were no reports of migraines between the upper, upper middle, and lower classes Epilepsy was indeed the second most common disorder, with a prevalence of (0.24 percent) in the lower middle class and (0.16 percent) in the upper lower class, followed by stroke. The 3rd most frequent disorder was (0.23 percent) in the lower middle class and (0.13 percent) in the upper lower class. There have been no reports of neurological disorders among the upper, upper middle, and lower classes.

Table-5: Neurological Disorders prevalence according to the socioeconomic status in urban population (%)

Neurological Disorders	I	II	III	IV
MIGRAINE	0.3	1.9	0.4	0
EPILEPSY	0	0.6	0.3	0.2
STROKE	0.1	0.5	0.1	0
CP	0	0.3	0	0
PARKINSONISM	0	0.1	0	0.1
DEMENTIA>5YEARS	0	0	0.1	0
OTHERS	0.1	0.3	0	0

Table 5 shows the social economic social standing prevalence of neurological disorders in the urban population. Migraine was the most common disorder in the urban population, with the highest prevalence in the upper middle class (1.9 percent). The upper and lower middle classes had prevalence rates of (0.3%) and (0.4%), respectively. The upper middle class had the highest prevalence of epilepsy, with a prevalence of (0.6 percent), followed by the lower middle class at (0.3 percent), and the upper lower class at (0.2 percent). In both the upper and lower classes, no cases of epilepsy were reported. The upper middle class had the highest prevalence of stroke, with a prevalence of 0.5 percent, while the upper and lower middle classes had a prevalence of 0.1 percent. There were no reported cases of stroke in either the upper or lower groups. Cerebral Palsy (CP) was reported only among the upper middle class, with a 0.03 percent prevalence. Parkinsonism was found in the upper middle and upper lower classes, with a prevalence of 0.1 percent in both. Dementia was reported to be 0.1 percent prevalent among the lower middle class, while other neurological disorders were reported to be 0.1 percent prevalent among the upper class (0.1 percent and upper middle class) (0.3 percent).

CONCLUSION

According to our findings, the study population had a crude prevalence of major neurological disorders of 2.6 percent. The global prevalence of neurological disorders is thought to be slightly lower than our findings for our study population. Our findings from 260 patients, on the other hand, are consistent with the estimated prevalence rates for neurological disorders in Pubmed studies. The prevalence has been estimated to range from 0.9 to 4%, with a mean of 2.3 percent.

Out of 260 patients, the prevalence of neurological disorders was higher in females in both study populations, namely the rural (1.3%) and urban (3.2%) populations. According to statistics, males had a higher prevalence of neurological disorders than females in. Females, on the other hand, had a higher rate of occurrence than males, which matched our findings. One of the reasons for the higher prevalence of neurological disorders in our female population could be due to a higher prevalence of migraine headache (as a contributor to neurological disorders). Women are three times more likely than men to suffer from migraines. Women account for the majority of migraine sufferers., accounting for 85 percent of all cases. It's also been suggested that the higher prevalence of neurological disorders among women in Pakistan is due to Pakistani women's higher survivability.

Stroke was found to be prevalent in our study (0.4 percent). The prevalence estimates obtained in our study are nearly identical to those obtained in other studies conducted across kpk. Pakistan

According to a 2018 update to Pakistan's stroke factsheet, the estimated age-adjusted prevalence

rate for stroke in rural areas ranges between (0.084 percent –0.26 percent) and (0.33 percent –0.42 percent) in urban areas.

In our study, the overall prevalence of dementia was (0.04%); in the urban region, the prevalence was (0.1%), and in the rural area, the prevalence was (0.1%). (0.03 percent). In both rural and urban settings, males were twice as likely as females to develop dementia, with a ratio of 2:1 and 1:0, respectively. The lower prevalence in our study is related to the fact that our study sample is diverse, whereas most other studies have focused on the elderly. A population distribution adjusted for age may provide a more accurate estimate of prevalence.

The low prevalence of Parkinson's disease in Pakistan (with the exception of the Parsi population) in comparison to Western countries contradicts the intriguing findings of Muthane et al., who observed that normal human brains in Pakistan have a 40% lower number of malassezia neurons in the substantia nigra than brains in Local Population.

Undiagnosed Parkinson's disease in the elderly is a problem in many countries, and as a result, patients are denied treatment and essential health care services. Because of the lack of a potential biomarker, the disease's prevalence in the elderly, and its relative rarity, determining risk factors in Parkinson's disease is difficult.

Despite policymakers and administrators continuing to believe that neurological problems are primarily urban in nature, the burden of neurological diseases is increasing in Pakistan. Due to a shortage of specialised personnel, the task of providing neurological care to Pakistanis is daunting. As a result, there is an urgent need to shift tasks in primary care through capacity building.

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