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UNDERSTANDING SEIZURES; KNOWLEDGE,ATTITUDES AND PRACTICES AMONG UNDERGRADUATE STUDENTS IN PESHAWAR, PAKISTAN

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ABSTRACT

Objective: The main objective of this research was to examine the knowledge, attitudes, and behaviors of undergraduate students in Peshawar, Pakistan, who are studying in different universities.
Material and method: For data collection, Google Forms questionnaire was administered to a diverse group of undergraduate students in Peshawar, Pakistan. Out of the collected responses, 384 well-completed forms were chosen for further analysis. The questionnaire comprised four sections: demographics, knowledge, attitude, and practices.
Results: In a survey of 384 students, it was found that a significant 92.2% of them were aware of epilepsy, either through personal exposure or reading about it. Additionally, 62.5% reported knowing someone with seizure disorders, and 61.2% had witnessed a seizure event. Impressively, a substantial 83.3% correctly identified epilepsy as a neurological condition. When it came to cognitive capabilities, a noteworthy 75.5% believed that individuals with epilepsy retained normal cognitive function. In terms of treatment, 82.8% of the respondents supported medical intervention as the appropriate approach for managing epilepsy.
Conclusion: The study's findings suggest that undergraduate students in Peshawar, Pakistan, possess a moderate level of knowledge about epilepsy, which is less than what was observed in a similar study conducted in Karachi, Pakistan.

Introduction:

Seizures are non-contagious neurological disorders characterized by the repetitive, hyper synchronous activities of cortical neurons. These discharges can present in two ways: as clinical seizures, which exhibit observable signs and symptoms, or as electrographic or subclinical seizures, detectable only through an electroencephalogram. Seizures happen when the balance between brain excitation and inhibition is disrupted. Different factors, including genetic and acquired ones, can cause unbalancing. The earliest known record of a seizure-like condition dates back to 2000 B.C. in Mesopotamia, with symptoms similar to epilepsy.[1] Over history, there was a belief that evil spirits caused epilepsy, but Hans Berger's invention of the electroencephalogram and William Lenox's research in the 20th century finally shifted the understanding of epilepsy towards abnormal brain electrical activity, dispelling older beliefs about its origins.[1] symptoms and warning signs of seizure include staring into space, uncontrollable limb movements, muscle rigidity, altered consciousness, loss of control over bodily functions, unexplained falls, unresponsiveness to stimuli, confusion, rapid eye blinking, and psychological symptoms like fear or déjà vu. Auras, which can precede focal seizures, may involve various sensations such as stomach discomfort, emotional feelings, or sensory disturbances. Dizziness and hallucinations are also possible warning signs.

Seizures are associated with increased activity in specific brain areas. Common seizure-related regions include the hippocampus, amygdala, frontal cortex, temporal cortex, and occipital cortex [2]. Frontal lobe seizures originating in the immediate motor area cause motor symptoms. Seizures affecting the frontal eye field lead to lateral eye deviation, while those involving Broca's area cause language problems [2]. Premotor area seizures result in forced head turning (versive seizures). Temporal lobe epilepsy (TLE) is the focal epilepsy type, accounting for nearly two-thirds of medication-resistant cases [2] .TLE can be divided into mesial temporal lobe epilepsy (mTLE), related to volume loss in the hippocampus and anterior thalamus, and neocortical temporal lobe epilepsy (nTLE), also known as extra hippocampal or lateral neocortical Epilepsy(2).

The International Classification of Epileptic Seizures categorizes seizures into generalized and partial types. Partial seizures are divided into simple and complex. Generalized seizures include various subtypes. Seizures can also be categorized based on their underlying cause: symptomatic and idiopathic seizures [3] .Symptomatic seizures are related to known medical conditions or other identifiable factors, while idiopathic seizures, also known as self-limited childhood focal epilepsies, lack an apparent cause[3] .Idiopathic seizures encompass specific subtypes, and two prominent ones are benign partial Epilepsy of childhood with Centro-temporal spikes (BRE) and benign partial Epilepsy of childhood with occipital paroxysms[3] . These subtypes of seizures are usually focal, short-lasting, and happen mostly in childhood. [3]

Epilepsy represents a significant worldwide public health concern, contributing to millions of disability-adjusted life years annually. Low- and middle-income countries bear the heaviest burden of epilepsy-related deaths and disabilities, with over 80% of fatalities occurring in these regions. While there has been a decline in epilepsy-related deaths globally since 1990, countries with lower sociodemographic indices have seen the most minor progress [4]. New anti-seizure medications have become available in the past two decades but approximately 40% of individuals with Epilepsy may resist drug therapy [5]. A study revealed that idiopathic Epilepsy and Epilepsy due to other causes

accounted for 18.3 million international years lost due to disability in 2019, constituting 2.1% of the total international years lost [5]. The standardized mortality ratio is higher among men, children, and adolescents, individuals with confirmed Epilepsy, and those with lower adherence to treatment [5]. A 1987 study based on the population revealed that active epilepsy prevalence in Pakistan stands at 0.98%. Notably, the ETG is strikingly high, with 98.1% in rural areas and 72.5% in urban settings, alongside the persistence of social stigma [6]. In high-income countries (HIC), the standardized mortality ratio ranges from 1.6 to 3.0, while in low- and middle-income countries (LMIC), it is considerably higher, with a ratio of 19.8 (95% CI 9.7–45.1) [7]. Men, children, adolescents, individuals with identifiable epilepsy causes, and those with lower adherence to treatment have slightly higher mortality ratios [7]. In LMIC, indirect causes of death include not only drowning and burns but also limited access to healthcare facilities and preventable factors [7].

Epilepsy is associated with psychiatric, cognitive, and social comorbidities, significantly affecting patients' quality of life. Studies indicate that the lifetime prevalence of overall anxiety among individuals with Epilepsy can be as high as 22% [8]. Moreover, depression is found to be 3–10 times more prevalent in people with Epilepsy than in those without the condition [8]. In addition to mental health concerns, individuals with Epilepsy also face a higher incidence of physical health-related comorbidities. These conditions include hypertension, stroke, asthma, arthritis, and diabetes, which are more prevalent in epileptic patients[8].

Clinical examination is the primary method of diagnosing Epilepsy. In addition, it's essential to assess the patient for any other health issues that may mimic Epilepsy, like psychological issues, because psychogenic non-epileptic seizures (PNES) can mimic actual seizures [9]. Psychogenic nonepileptic seizures mimic epileptic seizures but lack the typical electrical brain activity seen in epilepsy. These events are rooted in psychological issues, typically linked to emotional distress [9]. A patient is diagnosed with Epilepsy if they have at least one unprovoked seizure, and there is a greater than 60% chance that they will have another unprovoked seizure at least one day apart. [10] The EEG test is vital as a supportive diagnostic tool in Epilepsy. It confirms the clinical diagnosis and can detect sub-clinical electrographic seizures. EEG can help classify various types of seizures and epilepsy syndromes, which can assist in providing precise diagnosis and planning for treatment. It's important to note that while EEG is valuable, some patients with Epilepsy may exhibit normal EEG reports despite experiencing seizures. Additional diagnostic tests like MRI and CT scans are necessary in such Cases. EEG not only confirms the diagnosis but also helps specify the type of epilepsy. Beyond diagnosis, EEG plays a role in deciding when to discontinue treatment for seizure-free patients and in evaluating critically ill individuals for conditions like status epilepticus and encephalopathies [11].

Epilepsy is a prevalent neurological disorder affecting around 50 million people globally, and despite numerous treatment options, it still ranks as the fourth most burdensome disease worldwide [12]. There are nearly 30 antiepileptic drugs (AEDs) available, with the majority introduced to the market in the last few decade [12]. Antiepileptic drugs (AEDs) are the first line of therapy for controlling Epilepsy. In cases where seizures are not well-controlled, combining two or more AEDs can be a viable option for candidates unsuitable for epilepsy surgery. Unfortunately, about one-third of individuals with Epilepsy do not respond effectively to these medications, a condition called drug-resistant

Epilepsy (DRE) [13]. Non-pharmacological approaches, including neurostimulation procedures such as Deep Brain Stimulation (DBS) and Vagus Nerve Stimulation (VNS), along with epilepsy surgery, have demonstrated their efficacy in managing drug-resistant Epilepsy [13]. Neurostimulation techniques like DBS and VNS involve implanted devices to deliver electrical impulses to specific brain regions or the Vagus nerve [13]. Epilepsy surgery, another non-pharmacological approach, aims to identify and remove the epileptogenic focus—the particular brain area responsible for triggering seizures [13].

Recent advancements in disease gene discoveries have profoundly impacted the field of Epilepsy Genetics. “Precision therapy" is emerging technique which involves gene sequencing to identify the specific genes responsible for Epilepsy [14].With gene sequencing technology, researchers can pinpoint the genetic factors contributing to Epilepsy in individual patients [14]. This personalized approach allows for targeted treatment strategies based on the patient's genetic makeup [14].

Epilepsy affects individuals during childhood and adolescence, impacting their education, career prospects, and socioeconomic status [15]. It has profound and lasting effects on various aspects of individuals' lives, leading to stigma within families and broader communities. The precise reason behind cognitive impairment in Epilepsy is still uncertain. But it may be related to the condition itself, its underlying causes, antiepileptic drug treatment, or a combination of factors. Efforts to address Epilepsy in young individuals involve diagnosis and treatment that includes various pharmacological and non-pharmacological approaches to manage the condition. [15]

Materials and Methods:

This descriptive cross-sectional study was conducted in Peshawar City, Khyber Pakhtunkhwa province, formerly known as the Northwest Frontier province, over a period of 2 months from June 1 to August 1. The study employed a non-probability sampling method, distributing a pre-designed questionnaire either by hand or through Google Forms to target 384 undergraduate students conveniently, studying in various universities in Peshawar City. Students aged between 18-30, studying in different universities, irrespective of their current semester or field of study, were included. Students who were psychologically depressed, mentally challenged, or had experienced any psychogenic non-epileptic seizure were excluded. Verbal informed consent was obtained from all sampling units. The questionnaire, comprising both open and closed-ended questions, was divided into four subsections covering demographics, knowledge, attitude, and practices, respectively. Some questions were of the "YES, NO, I don't know" type, while others were multiple-choice questions. Responses were collected by hand from physically present students, and for those absent, a Google Form was created to collect their responses. The collected data was then entered into an Excel sheet and analyzed using SPSS Version-22.

Results:

The study encompassed 384 participants, revealing a gender distribution of 68.8% males and 31.3% females. Of the total, 21.4% were under 20 years old, while 78.6% were older. Remarkably, 99.7% identified as followers of Islam, with a solitary participant (0.3%) being non-Muslim. The ethnic composition comprised 97.4% Pashtun and 2.6% non-Pashtun.

Regarding marital status, 8.6% reported being married, and 91.4% were non-married. In terms of socioeconomic status, 4.9% identified as poor, 91.4% as middle-class, and 3.6% as upper-class. Notably, 64.3% were in

the medical field, while 35.7% pursued non-medical fields.

Table 1.Demographics-wise distribution of participants.

S.No.	VARIABLE	STATUS	Frequency	Percentage
1	GENDER	Male	264	68.8
		Female	120	31.3
		Total	384	100.0
2	AGE	Below 20 years	82	21.4
		Above 20 years	302	78.6
		Total	384	100.0
3	RELIGION	Muslim	383	99.7
		Non-Muslim	01	0.3
		Total	384	100.0
4	ETHNICITY	Pashtun	374	97.4
		Non-Pashtun	10	2.6
		Total	384	100.0
5	MARITAL STATUS	Married	33	8.6
		Non-Married	351	91.4
		Total	384	100.0
6	Socioeconomic Status	Poor	19	4.9
		Middle	351	91.4
		Upper	14	3.6
		Total	384	100
7	FIELD	Medical	247	64.3
		Non-Medical	137	35.7
		Total	384	100.0

Knowledge-wise, 92.2% were familiar with epilepsy, primarily through books (52.3%) and online sources (12.0%). Personal connections with individuals with epilepsy were reported by 62.5% of respondents. Concerning family impact, 22.7% had multiple family members with epilepsy, while 67.7% did not.

Table 2.Knowledge-wise distribution of participants.

Question	Status	Frequency	Percentage
Have you ever heard or read about epilepsy?	Yes	354	92.2
	No	16	4.2
	I don't know	14	3.6
From where you've heard or read about epilepsy?	Books	201	52.3
	Electronic Media	46	12.0
	Friends	37	9.6
	Health practitioner	45	11.7
	Parents	55	14.3
Do you know anyone who has epilepsy?	Yes	240	62.5
	No	122	31.8
	I don't know	22	5.7

Do you know a family having two or more epileptic patients?	Yes	87	22.7
	No	260	67.7
	I don't know	7	9.6
Have you ever seen anyone who was having a seizure?	Yes	235	61.2
	No	120	31.3
	I don't know	29	7.6
Is it okay for your children playing with epileptic patients?	Yes	175	45.6
	No	136	35.4
	I don't know	73	19.1
What sort of a disease is epilepsy?	Non communicable	1	0.3
	Contagious	13	3.4
	Hereditary /neurological	3	0.8
	Neurological	320	83.3
	Psychiatric	33	8.6
	Hereditary	14	3.6
What is the cause of epilepsy?	Accident	18	4.7
	Fever	13	3.4
	Depression	29	7.6
	Neurotransmitters	4	1.0
	Black Magic	18	4.7
	Brain disorder	198	51.6
	Inherited disorder	102	26.6
	I don't know	2	0.5
What are the signs and Symptoms of epilepsy?	lossof conciousness	242	10.9
	Foaming of mouth	20	5.2
	Movement of legs and arms	20	5.2
	Uncontrolled jerking	29	7.6
	All of the above	273	71.1
What examinations are used to diagnose epilepsy?	EEG	193	50.3
	X-RAY,MRI,CT	84	21.9
	Blood Tests	11	2.9
	Psychological test	19	4.9
	Dam Darood	4	1.0
	I don't know	73	19.0
How epilepsy transmits?	Genetic	28	7.3
	Direct contact	44	11.5
	Dreaming about diseased person	79	20.6
	Brain infection	15	3.9
	Doesn't transmit	77	20.1

	I don't know	54	14.1
	Through blood transfusion	87	22.7

Attitudes revealed 59.6% hesitating about marrying someone with epilepsy. Driving privileges for individuals with epilepsy were supported by 34.9%, while 52.9% disagreed. Friendship with individuals with epilepsy was embraced by 74.7%.

Treatment preferences indicated 82.8% recommending medical assistance, contrasting with alternative views, such as seeking help from a Mulla/Aamil (6.8%).

Table 3.Attitude-wise distribution of participants.

Question	Status	Frequency	Percentage
Would you allow your son or daughter marrying an epileptic patient?	Yes	77	20.1
	No	229	59.6
	I don't know	78	20.3
Do you think that people with epilepsy can be employed in jobs, like others?	Yes	247	64.3
	No	80	20.8
	I don't know	57	14.8
Do you think that epileptic patients should not marry?	Yes	56	14.6
	No	263	68.5
	I don't know	65	16.9
Do you think that epileptic patients can think like any normal person?	Yes	290	75.5
	No	57	14.8
	I don't know	37	9.6
Do you think that epileptic patients can drive a car?	Yes	134	34.9
	No	203	52.9
	I don't know	47	12.2
Would you personally be willing to marry an epileptic patient?	Yes	94	24.5
	No	214	55.7
	I don't know	76	19.8
Would you personally be willing to make friends with an epileptic patient?	Yes	287	74.7
	No	62	16.1
	I don't know	35	9.1
Would you personally be willing to work with an epileptic patient?	Yes	269	70.1
	No	76	19.8
	I don't know	39	10.2
If someone has epilepsy, what treatment would you suggest?	Medical doctor	318	82.8
	Mulla /Aamil	26	6.8
	Both Dr & Mulla	5	1.3
	Devine help	23	6.0

	untreatable	10	2.6
	I don't know	2	0.5

Practices during epileptic episodes showed 59.4% positioning the patient on their side, 75.8% intending to clear the airway, and 88.3% planning to call a doctor or nurse. Divergence existed in actions like providing mouth-to-mouth breathing (31.3%), inserting sweets into the patient's mouth (23.4%), and using chest compressions (40.6%). Notably, 81.5% agreed to take action to prevent injury during seizures. The study provided comprehensive insights into participant demographics, knowledge, attitudes, and practices related to epilepsy, contributing valuable data for further analysis.

Table 4.Practices-wise distribution of participants.

Question	Status	Frequency	Percentage
Place the patient on his/her side	Yes	228	59.4
	No	59	15.4
	I don't know	97	25.3
Clear the patient's airway	Yes	291	75.8
	No	42	10.9
	I don't know	51	13.3
Call the Doctor or nurse	Yes	339	88.3
	No	30	7.8
	I don't know	15	3.9
Provide mouth to mouth breathing	Yes	120	31.3
	No	185	48.2
	I don't know	79	20.6
Smell smoke of match stick	Yes	73	19.0
	No	190	49.5
	I don't know	121	31.5
Put sweets in the mouth	Yes	90	23.4
	No	187	48.7
	I don't know	107	27.9
Sprinkle water on the face of subject	Yes	198	51.6
	No	113	29.4
	I don't know	73	19.0
Insert a spoon or gag into the mouth	Yes	118	30.7
	No	178	46.4
	I don't know	88	22.9
Prevent the subject from jerking/shaking	Yes	242	63.0
	No	80	20.8
	I don't know	62	16.1
Distance myself from the subject	Yes	129	33.6
	No	188	49.0
	I don't know	67	17.4
Make sure his/her saliva doesn't touch	Yes	174	45.3
	No	102	26.6

	I don't know	108	28.1
Take action to prevent injury during an episode	Yes	313	81.5
	No	32	8.3
	I don't know	39	10.2
Restrain and perform chest compression	Yes	115	29.9
	No	156	40.6
	I don't know	113	29.4
If you were a school manager or director,would you allow children with epilepsy enroll into your school?	Yes	298	77.6
	No	46	12.0
	I don't know	40	10.4
I would remove offensive objects around	Yes	292	76.0
	No	52	13.5
	I don't know	40	10.4
I would protect his/her head from trauma	Yes	327	85.2
	No	32	8.3
	I don't know	25	6.5
I would keep ventilation "ON"	Yes	270	70.3
	No	58	15.1
	I don't know	56	14.6
I would put an object between the teeth	Yes	215	56.0
	No	107	27.9
	I don't know	62	16.1
I would loosen the collar of the shirt and the belt	Yes	264	68.8
	No	49	12.8
	I don't know	71	18.5
I would take objects out of his/her mouth	Yes	244	63.5
	No	62	16.1
	I don't know	78	20.3
I would take him/her quickly to a hospital	Yes	282	73.4
	No	71	18.5
	I don't know	31	8.1
I would wait for return to consciousness	Yes	240	62.5
	No	108	28.1
	I don't know	36	9.4
I would note the duration of seizures	Yes	282	73.4
	No	59	15.4
	I don't know	43	11.2
I would make a video of seizures	Yes	133	34.6
	No	204	53.1
	I don't know	47	12.2

Discussion:

Knowledge:

Bachelor students represent the mid-aged educated class of society and play an influential role; hence, the aim was to assess their knowledge, attitude, and practices regarding epilepsy. The analysis of 384 correctly filled questionnaires revealed a male predominance of 68.8% compared to 31.3% females. This contrasts with a similar study in Chakwal district, Pakistan, where the sample size was 512, and there was a female predominance of 60.9%. (16). Age-wise, 21.4% were below 20 years, and 78.6% were above 20 years in our study. Regarding religion, almost all (99.71%) participants were Muslims. A substantial percentage (92.2%) had heard or read about epilepsy, slightly lower than a similar study in the general population of Chakwal district, where 100% had knowledge about seizure disorders. A significant majority (83.3%) of participants referred to seizure disorder as a neurological disease, however, a small proportion (8.6%) identified seizure disorder as a psychiatric disorder. When asked about the causes of epilepsy, 51.6% attributed it to a brain disorder, 26.6% believed it was inherited. This contrasts with a study in India where 2.6% considered epilepsy a mental illness, and 64% believed it to be a brain disease, while 96% replied that it is hereditary... [17].

Attitude:

The results provided comprehensive insights into a diverse group's attitudes toward epilepsy. A significant majority (59.6%) exhibited hesitations about allowing their children to marry an epileptic patient, contrasting with a similar knowledge, attitude, and practices study where only 11.5% were willing to permit their offspring to marry an epileptic patient [18]

Regarding employment opportunities for epileptic patients, a substantial majority, 64.3%, held the view that epileptic individuals can perform as normally as others. This finding contrasts with a North Indian study where 79% of patients without epilepsy and 87.6% of epileptic patients believed in employing people with epilepsy. In that study, 11.94% of persons without epilepsy and 12% of patients with epilepsy held an opposite view [19].

When asked about the treatment of epilepsy, a significant majority recommended seeking medical assistance from a doctor. Interestingly, our study also identified that 6.8% of participants believed seeking help from religious personnel, such as Mullahs and Aamil, could treat epilepsy. Similarly, 6.0% proposed seeking divine intervention. Previous studies have shown that religion and spirituality significantly shape beliefs about epilepsy, especially in areas with prevalent traditional and supernatural views. Our findings indicated that 82.8% of participants endorse medications as a treatment, while only a minor percentage of 2.6% deemed epilepsy untreatable.

Practices:

Our study, focusing on undergraduate students, delved into their knowledge and collected responses regarding first aid for a seizing patient. In our findings, 59.4% of participants knew the importance of the recovery position, However, this percentage was lower compared to an impressive 96% in an Ethiopian study indicating familiarity with this step. Additionally, 75.8% of participants were aware of maintaining the air passage, but not all responses were accurate or ideal. Approximately 19% suggested an unconventional approach of smelling a matchstick as part of the first-aid strategy, and 23.4% mentioned putting sweets in the patient's mouth. Furthermore, 51.6% of students suggested throwing water on the patient's face. These findings highlight the existence of misconceptions that still need to be addressed. Our study also addressed how to manage a seizing patient, including losing the patient's collar and belt (68.8%), removing

nearby sharp objects (76%), and preventing head injury to the patient (85.2%).

Recommendations: it includes the implementation of targeted awareness programs in schools and colleges to educate people about providing first-aid during seizures. It's also advisable to provide training to teachers and school staff to assist individuals experiencing seizures.

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