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Assessment of Treatment Outcome and Associated Factors Amoung Epileptic Patients at Tgsh, Bahirdar Ethiopoia

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Wisdom at the Source of the Blue Nile

BAHIR DAR UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCE

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DEPARTMENT OF Internal Medicine

Assessment of Treatment Outcome and Associated Factors Amoung Epileptic Patients at Tgsh, Bahirdar Ethiopoia

Research Report To Be Submitted To Bahir Dar University, College Of Medicine And Health Sciences, School Of Medicine, Department Of Internal Medicine For Partial Fulfillment Of The Requirements For Internal Medicine Specialization Program

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Assessment of Treatment Outcome and associated factors among epileptic patients at Tibebe Ghion Specialized Hospital, Bahir Dar, Ethiopia.

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ACRONYMS

AED …………………………….anti-epileptic drugs

BDU………………………………Bahir Dar University

DM……………………………..Diabetes mellitus

HTN……………………………hypertension

MLIC………………………..middle and lower income countries

RVI …………………………….retroviral infection

SUDEP………………………….sudden unexpected death of epilepsy

TG………………………………..treatment gap

TGSH………………………….tebebe gihon specialized hospital

WHO………………………..World health organization

ABSTRACT

Introduction: Epilepsy is one of the most common serious chronic neurological conditions affecting people of all ages globally, Around 50 million people worldwide have epilepsy, of whom nearly 80% live in low- and middle-income countries. The treatment gap (percentage of people with epilepsy whose seizures are not being appropriately treated at a given point in time) is, estimated at 75% in low-income countries and is substantially higher in rural than in urban areas. Wide treatment gaps may result from a combination of lack of capacity in health care systems, inequitable distribution of resources and low priority accorded to epilepsy care

Objectives The main aim of the study is to assess the treatment outcome of epilepsy and associated factors among epileptic patients at neurology follow up TGSH, BahirDar, Ethiopia

Methods hospital based cross-sectional study using semi structured questionnaire and patient chart review was employed at TGSH. Data was cleaned, coded, and analyzed by using SPSS version 25. The results was displayed by using frequency tables and charts. logistic regression was used to test the association of variables Epilepsy treatment outcome was evaluated in terms of seizure control status in the last one year follow up period. .

Results total of 384 patients were included. Of whom, 66.6% had uncontrolled epilepsy. Being illiterate AOR [adjusted odd ratio (AOR): 7.541, 95% CI: 2.303_–24.688], living in rural residency [AOR: 10.743, 95%CI: 2.763–41.77, presence of triggering factor (AOR 67.187,CI 20.473-220.487) were perdictors of poorly controlled epilepsy. . also being female is 88 times more likely associated with uncontrolled epilepsy(AOR:0.127,95%CI0.043-0.378

Conclusions the finding of this study revealed that two third oof the epileptic patients had uncontrolled seizure. Epileptic patients who are illiterate, female, and whom from rural area, were more likely to have uncontrolled seizure.

Key words; treatment gap, seizure Freedom

1. Introduction

1.1.   Background

Epilepsy is one of the most common serious chronic neurological conditions affecting people of all ages globally. It is characterized by abnormal electrical activity in the brain, causing seizures or unusual behavior, sensations and sometimes loss of awareness .Around 50 million people worldwide have epilepsy, of whom nearly 80% live in low- and middle-income countries.. These countries include some of the poorest in the world that are heavily dependent on development assistance for health, most of which is targeted to treat communicable diseases (1).In Africa, epilepsy aff ected about 10 million people. Ethiopia is also one of the highly aff ected countries in Africa with an estimated prevalence of 5.2/1000(2)

The ultimate goal of epilepsy management is freedom from seizure and no side effects while having an optimal quality of life. Anti-epileptic drugs (AEDs) could successfully treat a great proportion of newly diagnosed patients; however inappropriate drug therapy in combination with non-adherence is leading to suboptimal seizure control. Furthermore, the treatment of epilepsy in developing countries remains far from satisfactory, mainly because of the inaccessibility of medications and suboptimal/lack of information and/or education on epilepsy for both patients and health-care providers.

The risk of premature death in people with epilepsy is up to three times higher than in the general population. Active epilepsy, especially when seizures are uncontrolled, poses substantial burdens because of somatic, neurologic, and mental health comorbidity; cognitive and physical dysfunction; side effects of antiseizure medications; higher injury and mortality rates; poorer quality of life; and increased financial cost . Thus, prompt diagnosis and seizure control confers numerous clinical and social advantages to persons with active epilepsy.(3)

About 70% of all patients with epilepsy might become seizure-free under appropriate epilepsy treatment. The treatment gap (percentage of people with epilepsy whose seizures are not being appropriately treated at a given point in time) is, however, estimated at 75% in low-income countries and is substantially higher in rural than in urban areas. Wide treatment gaps may result from a combination of lack of capacity in health care systems, inequitable distribution of resources and low priority accorded to epilepsy care. (1)

AED non-adherence is one of the common reasons for the poor treatment gap of epilepsy In Ethiopia, there are different traditional/supernatural beliefs that can have the potential to enforce people to prefer traditional help seeking behavior which may push people to miss or stop their anti-epileptic medication intake. The prevalence of anti-epileptic medication non-adherence was reported to be more than expected that accounts up to 68% in Southern Ethiopia (4)

People with poor anti-epileptic medication adherence are more prone to have frequent hospital admissions, repeated seizure attacks, increased health care cost, poor quality of life, poor treatment outcome and lowered level of productivity. It is also evidenced that antiepileptic medication non- adherence is associated with high rate of road accidents , injury and sudden death of patients due to the uncontrolled seizure attack(5)

Economic constraints , poor health care system and medical services , lack of medication access , unrecognized anti-epileptic medication side effects, substance use or drug abuse and poor seizure control status are expected to contribute for the high burden of antiepileptic medication non-adherence and subsequent poor seizure control in Ethiopia(6)

1.2.   Statement of the problem

Although most of the people with epilepsy can become seizure-free with the optimal use of drug therapy, the treatment outcome in the majority of epileptic patients remains unsatisfactory in resources limited countries including Ethiopia. Studies have shown that majority [80–90%] of the patients with epilepsy are not receiving appropriate treatment in developing countries(7)

Worldwide, mortality among people with epilepsy is reported to be two to three times higher than that in the general population and even more in resource limited setups. Causes of death include status epileptics (prolonged uncontrolled convulsions), sudden unexplained death in epilepsy (SUDEP), an suicide. Epilepsy is thought to be caused by witchcraft, evil spirit, and God's punishment for sins in many developing countries. As a result, people with epilepsy suffer from double burden from their illness and usually suffer from stigma, discrimination, depression, and other psychiatric problems

The Overall picture shows the number of epileptic patients who suffer from the uncontrolled seizure is increasing in Ethiopia particularly in TGSH Bahir Dar. Because of the cultural beliefs about the disease, non-acceptance and non-compliance with care by patients and their families; lack of knowledge, the high cost of drugs and their relative unavailability; and the psychosocial effects of the disease; this all put a huge burden economically, socially and politically on the patient, family, the community, the hospital and the country at large

The treatment gap in developing countries can be improved through educational interventions focused on patients and health providers, including traditional healers. The aim of this is to increase the knowledge of diagnosis and management of the disease, promoting the concept of epilepsy as a treatable condition. It also needs to include an anti-stigma intervention and a self-management education program, which empowers patients to participate more actively in managing their care.

For large areas of Africa, particularly Ethiopia, there are few data's on the outcome of epilepsy treatment. This is true also in TGSH. Without the knowledge of the magnitude and associated factors of uncontrolled epilepsy , the preventable associated factors for poorly controlled epilepsy will not be handled and this leads to increase magnitude of patients suffering from uncontrolled seizure Which has a double hit to the individual, the family and to he country.

1.3.Justification

There is a paucity of knowledge on treatment outcome of epilepsy, and research supporting it, yet not surfaced all over the world, badly the developing one. Major issues of importance related to epilepsy in African and other developing countries include high prevalence of preventable causes of epilepsy like head injury, road traffic accident, preinatal asphyxia; unavailability and high cost of drugs, delayed and missed diagnosis, and poor seizure control. The patient suffered from unnecessary complication because of lack of early diagnosis, poor follow up, inadequate health education and lack of giving priority by health sectors as epilepsy is a public health concern. Statusepilepticus burns and other injuries, and sudden death could be preventable with proper management of an epilepsy case. Intensive care unit management of status epilepticus, and severe burns because of uncontrolled seizure, share the budget need to prevent other critical conditions in the hospital and in the country. It has also put the patient at the expense of life, hinder from his work, education and social participation because of stigma and discrimination. The family, the community and the country put on economic, and social and crises.

1.4.Significance of the study

Health service to prevent mortality and morbidity due to uncontrolled epilepsy, Knowledge about factors affecting seizure control and treatment outcome will give insight about holistic management of epilepsy beyond prescribing drugs. Knowing the prevalence of controlled versus uncontrolled epilepsy alarm the respected body for the seriousness of the diseases, Understanding factors associated with treatment outcome has the potential of improving our knowledge of the disease, enhancing the development of patient, professional and population based interventions to reduce the proportion of patients with uncontrolled epilepsy with the standard drug management

There for this research has a sound importance to know the burden of uncontrolled epilepsy, the associated factors, at patient, health facility and community level, And how to address these factors so that patients will achieve seizure freedom. This in turn decrease bed occupancy in the hospital because of admission from acute complications of seizure and reduce the amount of human and material resource needed to control it. Also prevent loss of the productive part of the society, social stigmata, depression and other mental illnesses from frequent seizure attacks social and economic crises at the individual, family, community and country level, Give opportunity to for the respected health institution to allocate their budget and prevent other

An update of understanding of the treatment outcome of epilepsy in TGSH is timely to provide an overview of the situation now. The finding of this study may be used as a base line data for those who are interested in carrying out further study

2. Literature review

2.1. MAGNITUDE AND ASSOCIATED FACTOR IN EPILEPSY

The CDC 2013 and the 2015 National Health Interview Surveys (NHISs) To obtain recent and reliable estimates of active epilepsy and seizure control status in the united state (U.S.) population showed that Although 90% of adults with active epilepsy were taking epilepsy medication, less than half (44%) of those taking medications were seizure-free in the past year. The A higher prevalence of active epilepsy and poorer seizure control were associated with low family income, unemployment, and being divorced, separated, or widowed.(8)

The socio-demographic profile of patients with epilepsy from LMIC is characterized by low education, unemployment, and single status .These findings are not exclusive to people with low incomes; for example, a recent study performed in Denmark showed that patients with epilepsy studied less than the general population, had higher unemployment rates, and were more likely to be single or divorced. This sociodemographic profile is directly related to the stigma. Where epilepsy is heavily stigmatized, the social and economic morbidity of the disease promotes a vulnerable condition characterized by limited opportunities for education, employment, and marriage .

Recently, one study performed in five LMIC of Africa (South Africa, Tanzania, Uganda, Kenya and Ghana) aimed to describe the clinical features, the causes and the consequences of active epilepsy in those regions. The authors found that 51% of the patients evaluated were children and 69% of seizures began in childhood. Statusepilepticus occurred in25% and only 36% received antiepileptic drugs. The main causes of active epilepsy were adverse perinatal events, acute encephalopathy and head injury. The main comorbidities were malnutrition, cognitive impairment and neurologic deficit. The main consequences were lack of education, being unmarried or unemployed, burns and head injuries. Therefore, this study currently reflects the reality of the epilepsy care in poor regions of the world(7)

Many people with epilepsy seek treatment from faith healers or religious healers for which they spend large sums in cash or kind, but with no beneficial effects. According to a prevalence study in Silivri, Turkey, 65%percent had visited religious figures at the onset or during the course of

the disease. In a more recent study from Gambia, among persons with lifetime epilepsy, it was shown that traditional treatment i.e. originating within a set of cultural beliefs had been used by all.

In a study from rural India where only 12% of children with epilepsy were on treatment, it was shown that 62% of these had sought help in the past from a qualified practitioner and 44% from traditional practitioners. Approximately one third had received help from both. The stigma related to epilepsy emanates from the many myths and misconceptions perpetuated about the disease. Thus, people with epilepsy do not want to be identified as having epilepsy, and do not come forward to obtain treatment, even in the best of situations.(1)

In a study done in India by 2016 among epileptic people with poverty adherence for drugs were found to be 30.7% and nonadherence to be 44.3%. Low (illiterate or primary) education), polytherapy, and substance abuse were found to have significant association with nonadherence to AEDs. Age, gender, marital status, family composition, occupation, rural urban background, distance from health care facility, duration of epilepsy, and side effects of AED were not found to have significant association with adherence(9)

A study done Guinea a low-income country in West Africa n from 257 participants (143 children, 122 female), 25% had untreated epilepsy and 72% met criteria for poorly controlled epilepsy. 59% had>100 lifetime seizures and 58% reported a history consistent with status epilepticus. 38 school-aged children were not in school and 26 adults were unemployed. 115 were not currently taking an AED, including 50 participants who had previously taken an AED and stopped. Commonly cited reasons for AED discontinuation were perceived side effects, unaffordability, and unavailability of AEDs. Traditional medicine use was more frequent among children versus adults (92/143 vs. 60/114, p=0.048).57 participants had head injuries, 29 had burns, and 18 had fractures. (10)

During a cross-sectional survey of people in KilifiKenya 2012, the epilepsy treatment gap was 62·4%. In multivariable analysis, failure to seek biomedical treatment was associated with a patient holding traditional animistic religious beliefs , reporting negative attitudes about biomedical treatment, living more than 30 km from health facilities, paying for AEDs, having learning difficulties, having had epilepsy for longer than 10 years ,and having focal seizures.

Reduced adherence was associated with negative attitudes about epilepsy and taking of AEDs for longer than 5 years Kenya)(11)

Ametanalysis including 23 primary studies done in Ethiopia showed that the pooled prevalence of controlled seizure was 46%. A subgroup analysis of the primary studies showed a considerable variation in magnitude of seizure freedom by study regions, age groups, and seizure-free period. The analysis showed the highest prevalence of controlled seizure was found in Addis Ababa 52%, pediatric patients 77%, and a seizure-free period of less than six months 58%. On the other hand, the lowest prevalence of controlled seizure was found in Tigray 27%, adult patients 43% and a seizure-free period of six or more 41%. Higher frequency of seizure before treatment and medication nonadherence was associated with un controlled epilepsy(4)

An adherence to epilepsy is a milestone of the success and the effectiveness of pharmacological therapies. It has impacts in helping to prevent seizure events and reducing the cumulative negative impact of seizures in daily life. Non-adherence of AEDs in epilepsy patients may cause an increased risk of convulsive status epilepticus . And the most serious consequence of non-adherence would be the increased risk of sudden unexplained death in epilepsy patients. Due to those consequences, identifying the barriers to adherence of AEDs is observed as imperative to allow practitioners are developing some appropriate strategies to improve adherence rates((12)

a study conducted in TikurAnbessa specialized Hospital (TASH) one of the tertiary hospital in Ethiopia by 2020 ,Among patients with epilepsy Only one-third of the study participants had controlled seizure and the number of AEDs and medication adherence were contributing factors for suboptimal treatment outcome(13)

In study done 2014 at Ambo Hospital WestShewa, Ethiopia to assess treatment outcomes and associated factors, 44.7%with epilepsy had poor seizure control, despite the prescription of appropriate doses of anti-epileptic drugs. Poor treatment outcomes among epileptic patients is associated with level of adherence, number of seizure attacks before anti-epileptic drugs initiations, electroencephalogram(neurologic abnormality) and age at onset of seizure (diagnosis)The most common seizure triggering factors were emotional stress (97.4%), sleep deprivation (78.1%), missing meal (29.8%)and missing medication (21.9%). 53.8% were also non-adherent to medication. (14)

During 2018 a study done at Meazantepi teaching hospital southwest Ethiopia on predictors of epilepsy treatment outcome showed that ,Medium medication adherence poor medication adherence, head injury before seizure occurrence, and seizure attacks≥4 episodes/week before AEDs initiation were the predictors of uncontrolled seizure(15)

Meta-analysis included twelve Ethiopian studies involving a total of 3416 epileptic patients by 2020 showed that the national pooled prevalence of antiseizure medication non-adherence was 41.96%. Patients who paid for their medications, took them for more than a year, had co-morbidity, and felt stigmatized were more likely to be non- adherent than their counterparts (systemic review)

In study done by 2017at Ayder comprehensive specialized hospital, Mekelle Ethiopia to identify predictors of treatment outcome showed that 46.6% had controlled seizures. Whereas, 38.5%, 8.8%, and 5.9% had experienced seizure attacks 1–5 times, 6–10 times, and greater than 10 times, respectively. Alcohol consumption, negative medication belief ,low medication adherence , and presence of co -morbidities were predictors of uncontrolled seizure.(16)

2.2.   Conceptual framework

Individual factor

➢ Area of residence

➢ Educational status

➢ Medication adherence

➢ alcoholism

Treatment Outcome of epilepsy (controlled or uncontrolled epilepsy)

Family & socio economic factor

➢ Availability of AED

➢ Cost of AED

➢ Income level

➢ Cultural and religion beliefs

Disease factors

➢ Frequency of seizure

➢ Duration of epilepsy

➢ Presence of comorbidites
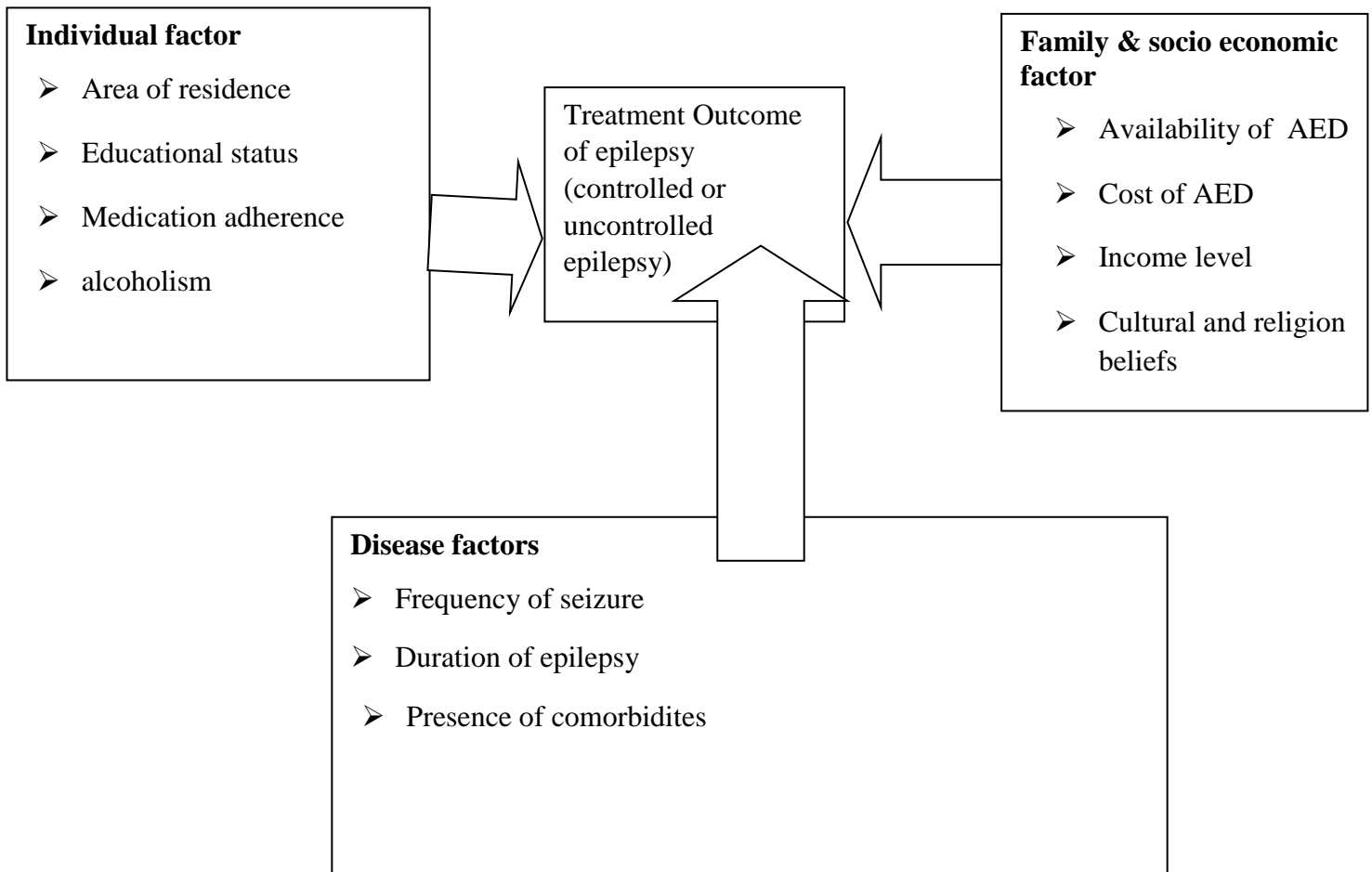
Figure 1Conceptual frame work of treatment outcome and associated factor in epileptic patient at TGSH (Developed from literature)

3. Obectives

3.1. General objective

The main aims of the study is to assess the treatment outcome of epilepsy and associated factors among epileptic patients at neurology follow up clinic TGSH, Bahir Dar,Ethiopia

3.2. Specific objectives

To determine treatment outcome of epilepsy among epileptic patients at neurology follow up clinic TGSH, Bahir Dar, Ethiopia

To identify factors associated with treatment outcome of epilepsy

4. Material and methods

4.1.   Study area and period

The Hospital is located on the outskirt of vibrant Bahirdar city (one of the ten beautiful city in Africa and one of the twelve's UNISCO learning city award of 2015) about 10km south from the city center and 7km from the new bus station (Adisumeneharia)on the way Adet districtand about 23km from blue nile fall(Tis Abay).Bahirdar is the capital city of Amhara region in north Ethiopia and a port on the south shore the huge inland lake. It covers 28Km2 with 1,820m(5970 ft)elevation above sea level , located 578Km away north-northwest of Addis Ababa, average higher and lower temperature ranging from 25-32 ^{o}C to8-13 ^{o}C, average rain fall per month from 2- 1416mm and average rainy day per month from 1-28(125 per year). Based on 2007 census conducted by the central statistical agency of Ethiopia (CSA), the city has a total population of 221,991(108,456 men and 113, 535 women with 81.6% of urban inhabitant)from 21.5 million population of the region. Currently about 3,342 health post, 847 health centers and80 hospital (2 general , 73 primary) are found in the region which feed the 5 referral hospitals including TGSH. TGSH has a total of 1315working staffs (including 703 clinical staff and 211 residents).The hospital has 44 beds in medical ward female and male partition

The Hospital gives the following services; Inpatient(Internal Medicine, Surgery, Pediatrics, Gynecology and Obstetrics ophthalmology, maxillofacial and Psychiatry), outpatient (Internal Medicine, Surgery, Pediatrics, Gynecology and Obstetrics , ophthalmology, ENT, dermatology , radiology ,Psychiatry, laboratory and pharmacy and cervical cancer screening) and emergency(adult and pediatric).

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4.2.   Study design

A Hospital-based cross-sectional study among epileptic patients was conducted from February 2022 to May l. 2022GC.

4.2.1. *Population*

*4.2.1.1.*source of population

All epileptic patients that were seen at neurology follow up clinic TGSH, Bahirdar, Ethiopia from February 2022 to May. 2022GC

4.2.1.2.Study population

Selected epileptic patients that were seen at TGSH, from February 2022 to May. 2022 GC who full fill the inclusion criteria

4.3.Inclusion criteria

All adult epileptic patients age 18 and above who has at least 1 year of clinical follow-up at TGSH were included

4.4.   Exclusion criteria

Incomplete patient chart and critically ill patients will be excluded from the study

4.5. Variables

4.5.1. Dependent variable

- Treatment Outcome of epileptic patients

4.5.2. Independent variables

Precipitating factor, Duration of diagnosis, Types of drug, Number of drugs, Economic status ,Educational status,comorbidetis,Residential area, Drug adherence

4.6. Sample size and sampling procedure

4.6.1. Sample size

Sample size is determined using single mean population formula

$$n = Z_{\frac{\alpha}{2}}^{2} \frac{P(1-P)}{d^2}$$

Because the prevalence of treatment outcome of epilepsy is not known in Amhara region P is taken as 50%

So n = (1.96)2(0.5)(0.5)/(0.05)2 = 384 and

plus 10% non respondent rate the total sample size will be 422

4.6.2. Sampling procedure

Sample was selected by using systematic random sampling technique. There are currently a total of 886 epileptic patients with established follow up at TGSH. The k value is 2 (by dividing 886 to 422) and we will select the sample every 2nd from the total population. The first participant will be selected by using lottery methods.

4.7.   Data collection procedure

.A semi structured questionnaire that include sociodemographic characteristics, treatment outcome of epilepsy and factors affecting the treatment outcome was used to collect the data. As a result, the questioner will be prepared based on feasibility to the objective. A pretest was done to see the practicability of the questionnaire contents and parameters which was not possibly practical and removed. Also patients chart were reviewed to get information about the type of epilepsy, the antiepileptic drug they are taking, and the presence ofcomorbidetis using a checklist. Data was collected by the principal investigators, health professionals and interns who have knowledge about the research and the title of the research will be trained for one day about data collection procedure and the purpose of the research. Training was given by the principal investigator. Data quality was assessed every day after data collection to tackle the problems early

4.8.   Operational definition

The treatment outcome of epilepsy will be defined as either controlled or uncontrolled epilepsy

Controlled epilepsy: if the patient had not experienced any seizure attacks in the last one year,

Uncontrolled epilepsy: if the patient experienced one or more seizure attacks in the last one year follow up period

Comorbiity: patient with epilepsy who has additional chronic illness

Precipitating factor|: A physical emotional or personal factor that is thought to trigger the onset of seizure

5.   Quality assurance

The quality of the data was be assured through careful design and pretesting of the tools, proper training of the data collectors and supervisors, close supervision of the data collectors and proper handling of the data. In addition to the training which was given to the data collectors, the principal investigator was also closely supervised the field activity on daily basis. At the end of each data collection day the principal investigator would able to checke the completeness of filled data collection checklist and measurements taken; whether recorded information makes sense to ensure the quality of data collected. Besides this, the principal investigator was carefully entered and thoroughly cleaned the data before the commencement of the analysis.

6.   Data processing and analysis

Data was checked for completeness, then entered to Epi data 3.1, and exported to SPSS Version 23 for analysis. Descriptive statistics like percentage and mean and standard deviation was used to present socio-demography and clinical characteristics of participants. Simple and multiple binary logistic regression analysis will be conducted to identify candidate variables and associated factors respectively. Variables with a p-value of ≤ 0.25 in the simple logistic binary regression was remained in multiple binary logistic regression analysis to control the effect of confounding variables and to identify associated factors of outcome of epilepsy. Both crude and adjusted odds ratios with their 95% confidence intervals (CI) will be computed to measure the strengths of associations between variables. A p-value of <0.05 was considered as statistically significant Hosmer-Lemeshow goodness of fit test will be checked to assess model fitness.

7. Ethical consideration

Ethical clearance for the proposed research was obtained from research committee of TGSH. Letters of support was also received from the hospital. After explanation about the whole purpose of the study, further permission obtained. Confidentiality of the information was respected throughout the data collection process. As the study was conducted through review of

medical records and intervew, the study participant informed about the purpose, the benefit and risk involving the study. The recorded data was accessed by a third person and will be kept confidentially

8.   RESULT DISSEMINATION

The final results was given to TGSH, internal medicine department and for other responsible bodies and information will be further presented to annual conferences and will be published in reputable research journal.

9. Results

9.1. Sociodemographic characteristics of the study participants

A total of 384epileptic patients were included in this study and analyzed. Of whom, 66.7% were males and the mean (±SD) age was 31.3 ± 11.98 years. Majorities of the participants were farmers (38.5%) followed by students (15.4%).urban dwellers constituted 51.3%. A large proportion of the participants were illiterate and attended primary school (40.4% and 28.6%,) respectively

Table 1socio demographic characteristics of epileptic patients patients at TGSH,BahirDar ethiopia . 2022GC

Characteristics	No(%)
Age	
18-30	221
30-60	149
Above 60	13
Sex	
male	256(66.6)
female	128(33.3)
Marital status	
single	146(38)
married	161(41.9)
divorced	44(41.9)
widowed	33(8.6%)
Educational level	
illiterate	155(40.4)
Primary	110(28.6)
secondary	71(18.5)
Collage and above	48(12.5)
Occupation of the patient	

employed	94(24.5)	
farmer	148(38.5)	
student	59(15.4)	
merchant	37(9.6)	
Daily laborer	30(7.8)	
House wife	16(4.2)	
Place of residence		
rural	187(48.7)	
urban	197(51.3)	

9.2.Clinical and treatment related characteristics.

The majority (66.9%) of the study participants had uncontrolled seizure (seizure-free period less than 1 year).amoung this 46.5% of patients hads eizure frequency of 5 and above. About 49.2%of the studied patients with epilepsy had one or more seizure precipitating factors ,of which missing drug and stress (26.6% and 17.2%) respectively was identified as common triggering factors .Comorbidities were found among 28.4 % of participants and psycatric illness was the top mentioned comorbid illness accounts 7.3 %.

Table 2 Clinical and treatment related characteristics of the participants,TGSH,BhairDar ,Ethiopia 2022 GC

variables	Category	Frequency	Percent (%)
Seizure attack over past 1	Yes(uncontrolled epilepsy	257	66.9
	No(controlled epilepsy)	127	33.1
	<5	117	53.5

Frequency of seizure per year	5 and above	135	46.5
Presence of triggering factor	yes	189	49.2
	no	193	50.3
Drug type	mono therapy	232	60.4
	Polytherapy	152	39.4
Common AED	phenobarbital	25	6.5
	phenytoin	77	20.1
	carbamazepine	24	6.3
	Valporic acid	104	27.1
	Phenobarbitone +phenytoin	59	15.4
	Phenobarbital +valproic acid	30	7.8
	Phenytoin +valproic acid	39	10.2
Drug discontinuation over the past 1 year	yes	157	40.9
	no	225	58.6
comorbidity	yes	109	28.4
	no	257	71.6
EEG workup	yes	67	17.4
	No	317	82.6

of the study participants 60.4 % were on monotherapy of AEDs. valproic acid was the commonest drug patients were taking (27.1%) as monotherapy followed by phenytoin(20.1%).among patients taking polytherapy phenobarbital plus phenytoin were the common (15.4%)combination .
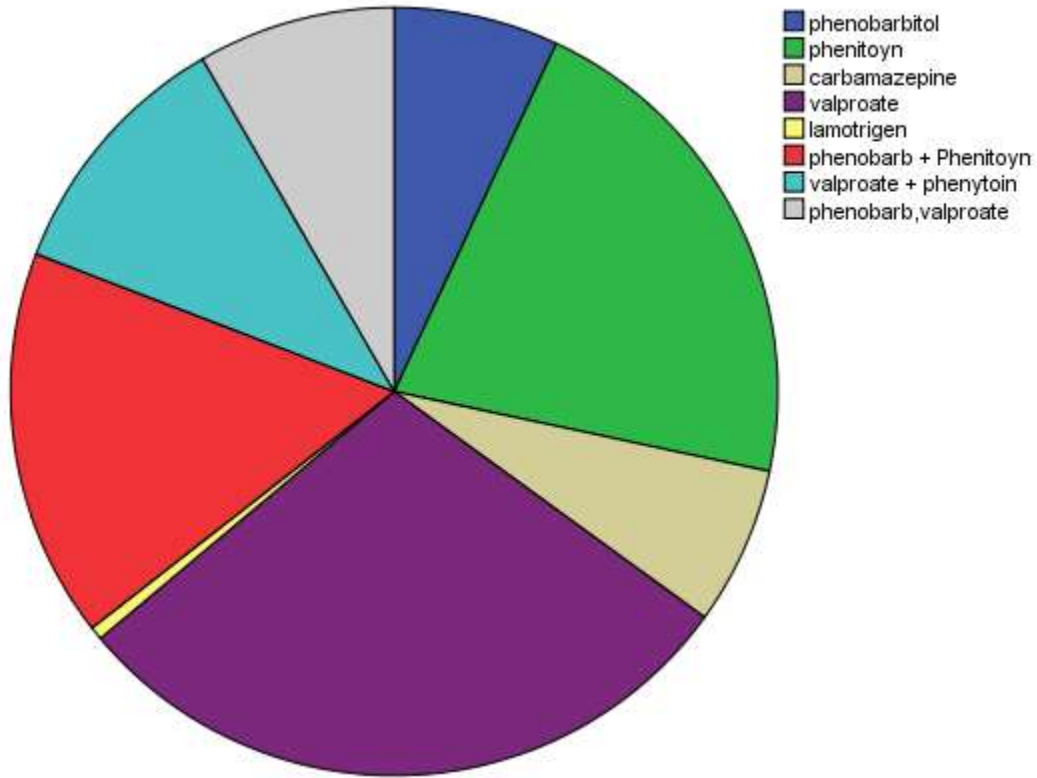
Figure 2 Drug characteristics of participants, TGSH, Bhair Dar, Ethiopia 2022E.C
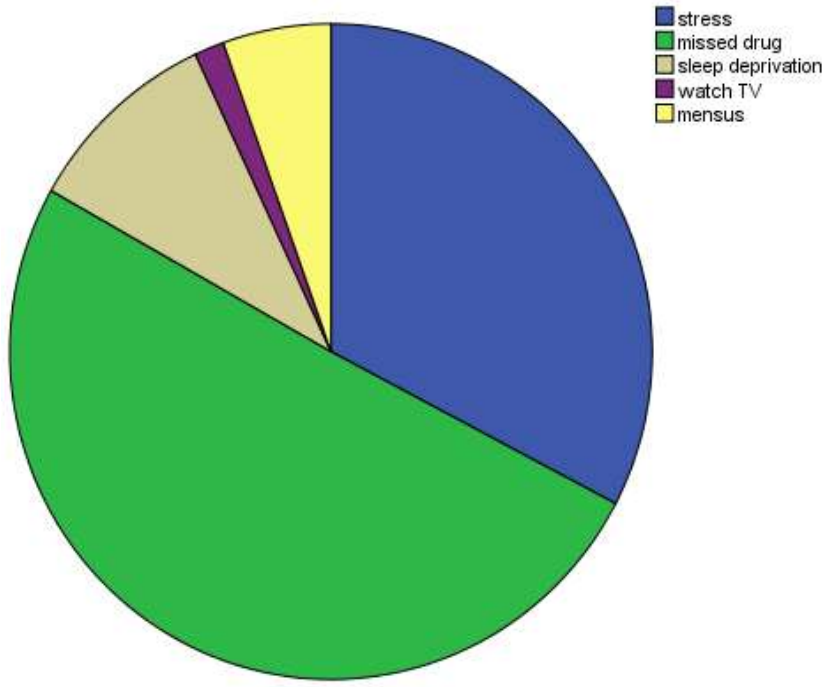
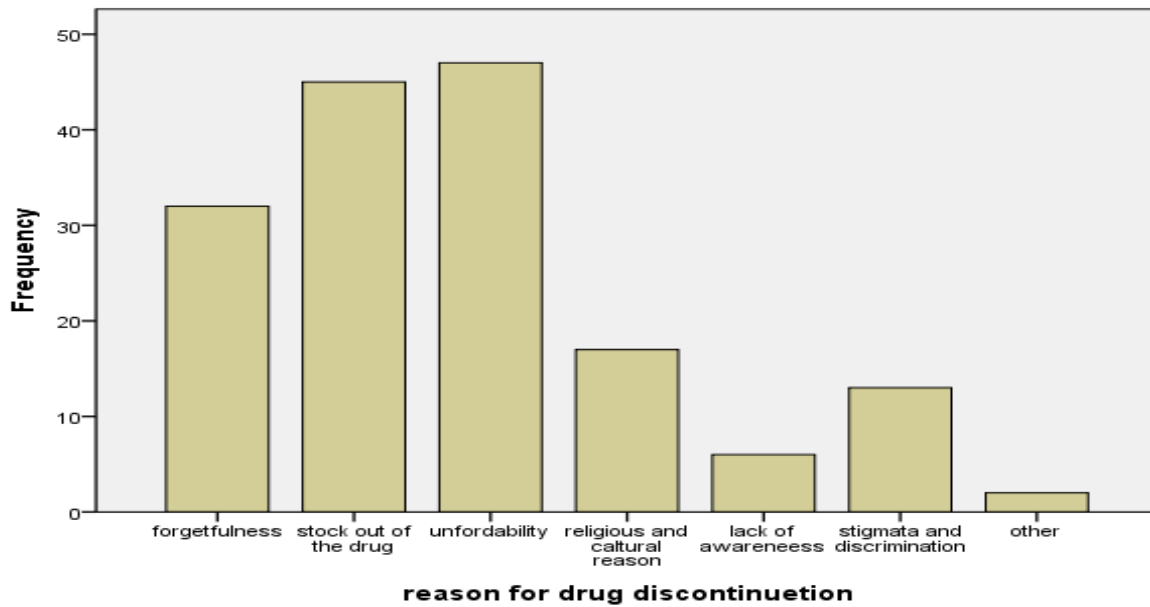Figure 3 triggering factors of epilepsy,TGSH,BhairDar,Ethiopia,2022GC

Figure 4 reason for drug discontinuation among epileptic patients TGSH,2022GC

9.2 Factors associated with treatment outcome of epilepsy

9.2.1. Bivariable analysis

Using univariable binary logistic regression analysis, epileptic patients with controlled seizure and uncontrolled were compared using the socio-demographic, disease and medication related characteristics. Accordingly being living in rural area [Crude odds ratio (COR): 2.907, 95% confdence interval (CI): 1.856–4.55], being illiterate   [COR: 2.126, 95%CI: 1.250–3.616], presence of comorbidity[COR: 16.69, 95%CI: 5.82–47.87], presence of triggering factor[COR: 17.656, 95%CI: 9.545–32.661], were significantly associated with uncontrolled seizure (table 3). Also being female was 70.5% more likely to have uncontrolled seizure (COR: 0.417, 95% CI: 0.255-0.683].

Table 3 Univariable logistic regression analysis of factors associated with treatment outcome of epileptic patients

Predictors	Treatment outcome		frequency	P value	AOR
	controlled	Uncontrolled	controlled		
Age	18-30	167(75.6)	54(44.3)	0.002*	2.718(1.513-4.882)
	30-60	82(55.7)	67(54.9)	0.001*	2.934(0.992-8.6677)
	60 and above	5	8	1	1
Sex	male	156(60.9)	100(39.1)	0.001*	0.417(0.255-0.683)
	female	101(78.9)	27(21.3)	1	1
Marital status	married	113(70.2)	48(29.8)	0.945	0.983(0.602-1.605)
	single	103(70.5)	43(29.5)	0.003*	2.825(1.427-5.592)
	divorced	20(45.5)	24(54.5)	0.459	1.345(0.613-2.951)
	widowed	21(63.6)	12(36.4)	0.459	1.345(.613-2.951)
Educational status	illiterate	118(76.1)	37(23.9)	0.005	2.126(1.250-3.616)
	primary	66(60)	44(40)	0.351	0.715(0.353-1.448)

	secondary	58(81.7)	13(18.3)	0.000*	7.016(3.430-14.319)
	Collage and above	15 (31,3)	33(68.3)	1	1
Place of residency	rural	147(78.6)	40(21.4)	0.000*	2.907(1.856-4.552)
	urban	110(55.8)	87(44.2)	1	1
employment	employed	48	44	0.014	13(1.675-104.02)
	farmer	98(66.2)	50(33.8)	0.052	7.653(0.983-59.609)
	student	41(69.5)	18(30.5)	O.078	6.585(0.807-53.709)
	merchant	25(67.6)	12(32.4)	0.070	7.200(0.849-61.078)
	Daily laborer	28(93.3	2(6.7)	1	1
AED catagory	monotherapy	81(34.9)	141(65.1)	0.000	0.191(0.112-
	polytherapy	98(64.4)	54(35.5)	1	
Presence of triggering factor	yes	175(92.6)	14(7.4)	0.000*	17.656(9.545-32.251)
	No	80(41.5)	113(58.5)	1	1
EEG	yes	220(69.9)	97(33.1)	0.54	0.32(0.095-1.019)
History of drug discontinuation	yes	113(72)	44(28)	0.103	1.445(0.928-2.105)
	No	144(64)	81(36	1	1

9.2.2. Multivariable analysis

On multivariable binary logistic regression model; being illiterate AOR [adjusted odd ratio (AOR): 7.541, 95% CI: 2.303_–24.688], living in rural residency [AOR: 10.743, 95%CI: 2.763–41.77, presence of triggering factor (AOR 67.187,CI 20.473-220.487) were found to be predictors of uncontrolled seizure also being female is 88 times more likely associated with epilepsy.(AOR:0.127,95%CI0.043-0.378)

Table 4 Multivariable logistic regression analysis of factors associated with treatment outcome among epileptic patients,TGSH,BhirDar,Ethiopia 2022GC

Predictors	Treatment outcome		Frequency(%)	P value	AOR
	controlled	uncontrolled			
Age	18-30	167(75.6)	54(44.3)	0.151	1.246(0.054-2.267)
	30-60	82(55.7)	67(54.9)	0.06	2.934(0.992-8.6677)
	60 and above	5	8	0.999	1
sex	male	156(60.9)	100(39.1)	0.000*	0.127(0.043-0.378)
	female	101(78.9)	27(21.3)	1	1
Marital status	married	113(70.2)	48(29.8)	0.002*	7.784
	single	103(70.5)	43(29.5)	0.003*	2.825(1.427-2.951)
	divorced	20(45.5)	24(54.5)	1	1
	widowed	21(63.6)	12(36.4)	0.459	1.345(.613-2.951)
Educational status	illiterate	118(76.1)	37(23.9)	0.001*	7.541(2.303-24.688)
	primary	66(60)	44(40)	0.114	3.178(0.757-13.338)
	secondary	58(81.7)	13(18.3)	0.002*	7.657(2.062-28.411)
	Collage and above	15 (31,3)	33(68.3)	1	1
Place of residency	rural	147(78.6)	40(21.4)	0.01*	10.743(2.763-41.772)
	urban	110(55.8)	87(44.2)	1	1
Presence of	yes	175(92.6)	14(7.4)	0.000*	67.187(20.473-

					220.487)
triggering factor					
	No	80(41.5)	113(58.5)	1	1
EEG	yes	220(69.9)	97(33.1)	0.54	0.32(0.095-1.019)
History of drug discontinuation	yes	113(72)	44(28)	0.114	0.494(0.206-1.185)
	No	144(64)	81(56)	1	1

10.Discussion

. Although evidence has shown that a greater proportion of epileptic patients become seizure free with the optimal use of the available AED, only 30 % of the patients have controlled epilepsy in this study.this is lower than a survey done by CDC on 2013 and the 2015 National Health Interview Surveys (NHISs) To seizure control status in the U.S.which showed (44%) of those taking medications were seizure-free in the past year(8). The difference is likely because of difference in socioeconomic status. This result is comparable to a study done in Guinea a low-income country in south Africa , showed 72% of epileptic patients met criteria for poorly controlled epilepsy(10). The finding is also comparable to a study done at Tikur anbessa hospital, Ethiopia by 2020, which showed Only one-third of the study participants had controlled

seizure(13) .the finding is lower than a study done at Ambo Hospital West Shewa, , and Mekelle ,Ethiopia which showed 44.7 and 46.6% respectively, had controlled seizures(13,14). The difference may be due to difference in study period, as the current covid 19 and political situation of Ethiopia affected the health care system and its utilization.

In this study being female, illiterate, and living in rural residency were significantly associated with uncontrolled seizure. Also, presence of triggering factors were also associated with poor seizure control and the common triggering factors mentioned by participants is missing or discontinuation of drugs. Tis could be explained that being female may be associated with poor health care utilization. Also being illiterate and rural residency may be associated with lack oof awareness and poor health seeking behaviors.

Even though not significant on multivariable regression model. drug discontinuation was mentioned by 41.1% present of participants in this study, it is significantly associated with poor seizure control in other studies(4,10,12,13)

In similar with this study, The result of a study done in India showed , Low (illiterate or primary) education, was mentioned as having significant association with poor seizure outcome. But Unlike this study , gender and rural background, were not found to have significant association with seizure control in this study done at India.(9).also In the rural area of Kenya, almost two-thirds of people with epilepsy were not adequately treated, the finding that support this study (11) .

In this study presence of comorbidity, monotherapy vs polytherapy were not associated with uncontrolled epilepsy, which is against a study done in india where polytherapy was significantly associated with poor seizure control(9)),and it is also against a study done at Mekelle where comorbidity had significant association with uncontrolled epilepsy(16)

In this study the most commonly identified triggering factors for seizure were drug missing followed by stress and sleep deprivation where as The most common seizure triggering factors identified in a study done at ambo were emotional stress followed by sleep deprivation , missing meal and missing medication (14).

11.conclusion

The finding of this research revealed that more than two third the epileptic patients have uncontrolled seizure. Epileptic patients who are females, being illiterate living in rural area, and presence of triggering factors were more likely to have uncontrolled seizure.

12.Recommendations

 particular consideration should be given to these potentially risk factors. Health Education programs especially addressing those illiterates, females and peoples living in rural area about the disease course, importance of their medication, adherence, and precipitating factors such as drug missing should be given.

TGSH should strengthen the care of epileptic patients, including focusing on availability of AEDS

Moreover, I recommend researchers to do further longitudinal and interventional studies with more strong study design to provide adequate evidence about the cause-efect relationship between the predictor variables and seizure control

13.Strength and limitation

13.1.   Strength

The strengths of this study give an insight for researchers and showed the burden of poor seizure control among patients in TGSH and possible associated factors

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13.2.   Limitation

Incomplete chart recording

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15. ANEXX

15.1.   Questionnaire

Part 1 Sociodemographic characteristics

1 Age ----------------------------------

2. Sex

a Male

b. female

3. Educational level

a. Illiterate

b.Primary education

c.Secondary education

D.College and above

4. Marital status

 a. Married

b.Single

c. Divorced

d.Widowed

5. Occupation

a. Government employee

b. Privateemployee

c. Farmer

d.Students

e.Merchants

f. Daily laborer

g.unemployed

6. Place of residence

a. Rural

b Urban

7. Monthly income_____

Part 2   about epilepsy and associated factors

1. For how long you have been epileptic_____

2. For how long you have been on medication_____

3. What drugs you are taking   circle all the drugs you are taking (patien chart will be reviewed)

a.Phenobarbitone

b.Phentoyn

c.Carbamazapine

d. valporic acid

e.lamotrigene

f.other specify_____

4. Comorbidetes (patient chart will be reviewed)

a. No

b.HTN

c.DM

d.RVI

e.Stroke

f cardiac illness

g. psycatric illness

5. Do you have any seizure attack for the past 1 year?

a.Yes

b.No

6. If yes how frequent your seizure was

a. <5 per year

b..5 and above

7. Do you have any triggering factor for seizure attack?

a. Yes

b.no

8. If yes what triggering factor do you notice for seizure attack?

a. Emotional Stress

b..Drug missing or discontention

c..Sleep deprivation

d.Watching TV

e. Menses (for females only)

f.Other specify

9.. Did you Miss AEDs doses in the past 1 year

a. yes

b.no

11. Did you discontinue AEDs for the past 1 year

a.Yes

b. no

12 What are the reasons for drug discontinuation and missing?

a. Forget fullenss

.b.Stockout of the drug

c..unaffordablity the drug

d.Drug side effect

e..Religious and cultural reason(going to holywater,traditional healers,)

f.Lack of education about AEDs

g. because of stigmata, discrimination

h.Other specify

16. DECLARATION

I, the under signed, declared that this is my original work, has never been presented in this or any other University, and that all the resources and materials used for the research, have been fully acknowledged.
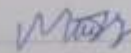
Principal investigator

Name: _Dr Aansal Addis (year III medical resident)_

Signature: _____

Date: _12/5/15 E.C_

Advisors

Name: _Dr Melaginet Moua_

Signature: _Mauy_

Date: _13/03/15 e.c_