QUALITY OF CARE IN WOMEN OF REPRODUCTIVE AGE WITH EPILEPSYAND KNOWLEDGE OF RESIDENTS ON WOMEN'S ISSUES IN EPILEPSY AT THE KENYATTA NATIONAL HOSPITAL.

BY

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DECLARATION

I **Dr. Beryl Achieng Otieno** declare that this is my original work and that to the best of my knowledge it has not been presented for the award of a degree in any other university.

Signed……..

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DEDICATION

This book is dedicated to my family: my son Jayson, Husband Samwel, my loving parents Ben & Pam, and my sister Edith. I am indebted to them for their unending love and support.

Special dedication to my son for patiently and lovingly enduring my absence while pursuing my studies

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LIST OF ABBREVIATIONS

AED	Anti-Epileptic Drugs
AAN	American Academy of Neurology
COCP	Combined Oral Contraceptive Pill
FSH	Follicle-Stimulating Hormone
GABA	Gamma-Amino butyric Acid
ILAE	International League Against Epilepsy
IGE	Idiopathic Generalized Epilepsy
KNH	Kenyatta National Hospital
KOWIE	Knowledge of Women's Issues and Epilepsy
LH	Luteinizing hormone
LTLE	Left Temporal Lobe Epilepsy
MCM	Major Congenital Malformations
NMDA	N-methyl-D-aspartate
PCOS	Polycystic Ovarian Syndrome
PGE	Primary Generalized Epilepsy
PHT	Phenytoin
PHB	Phenobarbitone
VPA	Valproic Acid
WHO	World Health Organization
WWE	Women With Epilepsy

ABSTRACT

Background.

Epilepsy is a common neurological disorder affecting men and women equally. However, its impact on women involves unique gender issues related to hormone effects on seizure control, seizure and drug effects on reproductive health, birth control options, and bone mineral density. Despite publication of guidelines, studies have found the care for Women with Epilepsy to be suboptimal. Studies have also demonstrated lack of knowledge by both health professionals and patients in the issues of Women with epilepsy.

Objectives

The objective of the study was to determine the quality of care of women of reproductive age with epilepsy at the Kenyatta National Hospital, and to assess the knowledge of Residents in Clinical Medicine and Obstetrics and Gynecology on issues of women with epilepsy.

Study Design and Site.

A cross-sectional descriptive study, at the Neurology Clinic, Kenyatta National Hospital.

Study Participants.

Women of reproductive age, with epilepsy.

Residents in Clinical Medicine and Obstetrics and Gynecology.

Methods.

Each week, a list of female patients booked for the neurology clinic, with a diagnosis of epilepsy was drawn up by the Principal Investigator. Selected patients had the study explained to them, and consent obtained. Their prescription patterns of antiepileptic drugs and folic acid were documented. Their awareness on issues of pregnancy, folate supplementation, contraception and bone health was also assessed using a study proforma. Residents from the departments of Clinical Medicine and Obstetrics &Gynecology (University of Nairobi) were asked to complete the Knowledge of Women's Issues and Epilepsy (KOWIE-II) questionnaire.

Results

The study took place between December 2014 and March 2015. One hundred and fourteen WWE of reproductive age were studied. Majority were on monotherapy (61%), the commonest drug being carbamazepine at 81%. Of those on polytherapy, dual therapy was the most frequent at 72%. The commonest polytherapy combination was carbamazepine/ valproic acid at 36 %. Majority were also on folic acid (60%). The awareness level was low, with only 17% informed on the need for folic acid, and 14 % on AED/ OCP interaction. Pre-conception counseling and advice on bone health had been given to only 10% and 6% respectively. The performance measure based on the AAN quality indicators was at 21%.

One hundred and sixty residents were surveyed from the department of Clinical Medicine and Obstetrics& Gynecology. Most residents understood the role of folic acid and the need to continue AEDs during pregnancy (95%). Majority were aware that AEDs decrease efficacy of OCP (92%).They agreed that AEDs could predispose to osteomalacia (80%). Fewer residents knew that WWE have increased sexual dysfunction (62.5 %).

Conclusion

The prescription practices were in relative conformity to guideline recommendations, but the awareness among patients was poor. The residents are knowledgeable in issues of WWE.

Recommendation

We recommend a condensed guideline, specific for W.W.E, to aid in the gaps in care. We also recommend continuous medical education to guide to best practice with regards to AED prescriptions and rationalizing polypharmacy. Further studies are needed to assess factors contributing to limited awareness among patients.

1.0 INTRODUCTION

Epilepsy is one of the most common neurological disorders(1). The World Health Organization (WHO) defines epilepsy as two or more recurrent unprovoked seizures**.** The International League Against Epilepsy (ILAE) recently expanded the definition to include: One unprovoked seizure and a probability of further seizures similar to the general recurrence risk after two unprovoked seizures (approximately≥ 60%),occurring over the next 10 years(2) .

Epilepsy affects approximately 50 million people worldwide, according to the WHO, with 80% living in the developing countries. Prevalence in African countries has been found to range between 5.2/1,000 to 58/1,000 population, with the prevalence in Kenya estimated at 18.2/1000(1). Locally, a study done in Kilifi , Kenya, found the prevalence at 2.9/ 1000(95% CI 2.6-3.2)(3). The disease affects women and men equally(4),with the risk for recurrent seizures being similar between males and females(5).

The impact of epilepsy on women involves unique gender issues related to hormone effects on seizure control, seizure and drug effects on reproductive health, birth control options, and bone mineral density(6).Women living with epilepsy also face a lot of stigmatization, with worse socio-economic status when compared to women with other non-stigmatized chronic medical conditions, i.e. unemployment, fewer years of formal education and lower marriage rates(7) .The perceived adverse effects of treatments and the number of anti-epileptic drugs (AEDs) also has an effect on the Quality of Life (8).

Studies done in the last two decades have consistently revealed a substantial lack of knowledge by both health professionals and patients in the areas of health of Women with Epilepsy (6, 9-11). Despite release and publication of guidelines, several studies have found the care to be suboptimal (12-16) . In most cases, specific prescribing considerations, diagnostic watchfulness, patient counseling, and use of supplemental medication can successfully overcome these challenges.

The local practice on the care offered to Women with epilepsy (WWE) is largely unknown. Data on this would be useful in the area of policy making and practice guidelines.

LITERATURE REVIEW

Epilepsy is a common neurologic disorder affecting women during the reproductive years(17). Seizures and some antiepileptic drugs (AEDs) can compromise reproductive health, and some AEDs can adversely affect hormonal contraception and bone metabolism(17).Women with epilepsy also have lower birth rates and more frequent anovulatory menstrual cycles. This is related to seizures and AED-associated reproductive endocrine disturbances(18). This review will focus on pregnancy, contraception, and bone health, whose management aspects have so far been addressed by practice guidelines.

1.1 PREGNANCY

1.1.1 Effects of epilepsy and anti-epileptic drugs on pregnancy

Epilepsy is the most common neurological disorder in pregnancy requiring continuous treatment (19),with studies estimating that three to four births per thousand will be born to WWE (20, 21).

Seizure frequency during pregnancy

Seizure frequency may increase during pregnancy for some WWE(22).This can in part be explained by changing sex hormone levels during pregnancy. Both estradiol and progesterone levels gradually increase during pregnancy.

Estradiol lowers seizure threshold by augmenting N-methyl-D-aspartate (NMDA) mediated glutamate receptor activity (23)and decreasing GABA synthesis. It also increases the density of spines and number of excitatory synapses(24), and enhances brain epileptogenic muscarinic neurotransmission (25).Progesterone exerts its inhibitory effects by potentiating GABA A-mediated chloride conductance(26).It also decreases nicotinic acetylcholine receptor mediated conductance (27), and the number of hippocampal CA1 dendritic spines (24).

Increase in seizure frequency is also partly due to changes in AED pharmacokinetics(28). Serum drug levels may be reduced because of increased volume of distribution, hepatic metabolism, or renal clearance. A drop in serum albumin during pregnancy also leads to reduced protein binding of AED's. Increase in seizures frequency, especially tonic-clonic may cause a fetal bradycardia or miscarriage, associated with high mortality for both the mother and fetus(29)

Fetal Abnormalities and AED's

Both maternal epilepsy and in utero exposure to AEDs can increase the risk of congenital malformations, low birth weight, developmental delay, and childhood epilepsy to the unborn child(22).One study found the Major Congenital Malformations(MCM) rates in the general population to vary between 1.6 and 3.2%(30),and women with a history of epilepsy but on no AEDs showed similar rates. However the odds ratio for MCM with AED monotherapy was 2.6, while the odds ratio for MCM with AED polytherapy was 5.1 (31).

Valproic Acid (VPA) has shown the highest risk for MCMs when used in the first trimester (31). It has been associated with a 1–2% risk of neural tube defects. Some studies have reported that daily doses of VPA greater than 1g/day carry a greater risk of spina bifida and other malformations(32) possibly due to high peak serum concentrations . It is also associated with an increased incidence of cardiovascular and urogenital malformations, and should be avoided either as monotherapy or polytherapy during reproductive age (29).Phenytoin (PHT) is associated with cleft lip and palate, dysmorphism and craniofacial abnormalities(29), while phenobarbitone(PHB) is associated with congenital heart defects, facial clefts, as well as dysmorphism(29).

The risk of congenital malformations with carbamazepine(CBZ) monotherapy is similar to that of lamotrigine(LTG) (32). In one study, there was a 0.9% reported risk of neural tube defects in the offspring of mothers who took CBZ through pregnancy(29). It is also associated with reduced head circumference at birth, developmental delay, and dysmorphic features (29).There is little evidence on pregnancy outcomes with the newer anti-epileptic drugs to accurately advise women. However, a recent review of oxcarbazepine did not find an increased risk for any specific pattern of malformations (33).

Seizure and AED management in pregnancy

The American Academy of Neurology (AAN) regularly publishes updated evidence-based practice guidelines (parameters) on the care of Women with Epilepsy. It recommends that during the child bearing age, the lowest effective dose of the most appropriate anti-epileptic drug should be continued, with the aim for monotherapy where possible(34). The rationale is to reduce the

risks of teratogenicity to the unborn child. Following delivery, it is usually recommended to gradually reduce the dose of the anti- epileptic drugs over a few weeks to its preconception levels, if the dose had been increased during pregnancy. This avoids the risk of maternal drug toxicity(29).

1.1.2 Preconception counseling

A major aspect in the care of WWE is preconception counseling, and this should be given to all WWE considering pregnancy. Guidelines recommend that WWE should be informed about the risks of epilepsy and seizure frequency, teratogenicity of AEDs, especially in polytherapy, and the need for folic acid supplementation throughout pregnancy. Women with Epilepsy should also be aware of issues relating to future pregnancy, genetics of their seizure disorder, vitamin K supplements, labor, breast feeding, and childcare. This information should be given in advance of sexual activity or pregnancy(34).

Although most children born to WWE are at a low risk of inheriting epilepsy, this risk is greater in an underlying genetic cause (35).For idiopathic generalized epilepsy (IGE), the risk of a child developing the condition is 5–20% if there is one affected first-degree relative, and over 25% if two first-degree relatives are affected. Thus, the risk of a woman with IGE having an affected child is about 9–12% (36). WWE need to have such information prior conception.

1.1.3 Folic Acid Supplementation

Enzyme-inducing anti-epileptic drugs(EIAEDs) such as phenytoin, carbamazepine, primidone and phenobarbital are known to decrease folate levels, while valproic acid is thought to interfere with folate metabolism(37).

Studies done indicate that folic acid supplementation during pregnancy may reduce the risk for MCMs. One study showed an increased risk for MCM with lack of folic acid supplementation (OR 16.88, 95% CI 4.79-59.52). The folic acid dose in this study was 2.5-5mg(38).Another study measured a significant association between serum folic acid concentrations <4.4nmol/L and neonatal malformation(adjusted OR 5.8,95% CI1.3-27,p=0.02) (39).

Folic acid supplementation should be provided to all women of childbearing potential. Due to the high rates of unplanned pregnancies, the general recommendation for dietary folate supplementation of all women during reproductive year should be reinforced for WWE(40).The dosage ranges between 0.4 to 4mg per day. This should be before conception and throughout gestation(40). However, there is insufficient published information to address the dosing of folic acid and whether higher dozes offer greater protective benefit to WWE taking AEDs.

1.1.4 Breast feeding

Drug elimination mechanisms are not fully developed in early infancy, therefore repeated excretion of a drug via breast milk may lead to its accumulation in the infant and pharmacological effects may occur(35). The AEDs concentration profiled in breast milk follows the plasma concentration curve (34).

Lamotrigine levels should be monitored in breastfed children whose mothers are taking high-dose lamotrigine (41).One study showed 30% infant lamotrigine levels compared with maternal plasma concentrations 2 weeks after delivery (41).Maternal benzodiazepine and barbiturate therapy can cause infant drowsiness. Levetiracetam breast milk concentrations have been found to be significantly lower in breast milk compared with maternal blood levels(42).The benefits of breastfeeding however, are believed to outweigh the small risk of adverse effects of AEDs(34), and thus breastfeeding should be encouraged.

1.2 CONTRACEPTION

There is a high rate of unplanned pregnancies in women with epilepsy, due to failure of hormonal contraception (29, 43). Many AEDs induce the hepatic CYP450 system, the primary metabolic pathway of the sex steroid hormones. These include PHT, CBZ, topiramate (doses above 200mg/day) among others. Some AEDs also induce the production of sex hormone binding globulin (SHBG).This leads to a lower concentration of free hormone and a more rapid clearance of the steroid hormone, thus ovulation can occur.

The efficacy of progesterone only oral contraceptives is also affected by EIAEDs (29, 43). Medroxyprogesterone injections may be effective, if administered every 10 weeks in patients on EIAEDs, while levonorgestrel implants are contraindicated in those taking EIAEDs, due to high

failure rate (29). Non EIAEDs have not shown any interactions with the hormonal contraception(43).

Davis et al.(44)administered a cross-sectional questionnaire to WWE (18–44years) in an urban, academic medical center. Half of the pregnancies in these women were unplanned. In the subgroup of women who had been sexually active a month prior to the study, 74% used contraception but only 53% used highly effective methods of contraception (intrauterine device, hormonal pill, patch and injection). Among those using hormonal contraception, 29% were on EIAEDs, increasing the risk of unplanned pregnancy. Overall, highly effective methods of contraception were under prescribed, such as intrauterine devices and intramuscular medroxyprogesterone.

The Oral Contraception Pill (OCP) can also affect the pharmacokinetics of AEDs. Studies have shown interaction of OCP with lamotrigine. This interaction is dependent on the phase of the OCP cycle, with a reduced serum lamotrigine concentration during OCP intake, and a rebound increase during the OCP free-interval (45) .Valproic acid clearance has also been shown to increase during the OCP intake period, compared with the OCP free interval(45).

The guidelines by the American Academy of Neurology recommend use of non-hormonal contraception or an estradiol dose of 50 micrograms or its equivalent for 21 days of each cycle when using OCP agents with the EIAEDs (33).

1.3 BONE HEALTH

WWE are at increased risk of fractures, osteoporosis, and osteomalacia. The causes are multifactorial, and include the adverse effects of AEDs on bone metabolism, vitamin D, and bone turnover. Trauma due to seizures and the subtle effects of AEDs on coordination are also causative(46).

EIAEDs lead to increased catabolism of vitamin D to inactive metabolites resulting in reduction of calcium. This leads to parathyroid hormone elevation, and elevation in bone turnover. Phenobarbital, phenytoin, and carbamazepine are among a class of drugs known as xenobiotics. Xenobiotics activate a nuclear receptor known as either the steroid and xenobiotic receptor (SXR) or pregnane X receptor (PXR). Pascussi et al (2005) found that xenobiotics up regulate

25-hydroxyvitamin D3- 24-hydroxylase (CYP24) in the kidney through activation of PXR. This enzyme catalyzes the conversion of 25-hydroxyvitamin D to its inactive metabolite, 24, 25-dihyroxyvitamin, rather than to its active metabolite, 1, 25-dihyroxyvitamin D (47). Another study found that xenobiotic activation of PXR increased expression of a different isoenzyme, CYP3A4, in the liver and small intestine (48).This enzyme converts vitamin D to more polar inactive metabolites.

Biochemical abnormalities in adults receiving AEDs include hypocalcaemia, hypophosphatemia, reduced levels of active vitamin D metabolites, elevated parathyroid hormone (PTH) levels, and elevated markers of bone resorption and formation(49). Kwasa J et al (2007) studied Bone Metabolism In Ambulatory, Premenopausal Women Using AEDs, at The Kenyatta National Hospital (50).She found significantly lower mean serum calcium and a higher alkaline phosphatase level among the patients than among the controls, indicating that long-term AED use significantly affects biochemical parameters of bone metabolism.

The American Academy of Neurology Quality measures and practice parameters recommend an annual review on information of drug effects to bone-health with the patients(51).

1.4 FERTILITY, SEXUAL DYSFUNCTION AND MENSTRUAL DISORDERS.

1.4.1 Fertility:

Epilepsy and the use of AEDs have been shown to alter the menstrual cycle and reduce fertility. Anovulatory cycles and hyperandrogenism contributes to this, as well as psychosocial factors(18).Kariuki J et al (2007) found the fertility rates of WWE at KNH at 46 live births/1000 women years, 2/3rds compared to that of the general population of women in Kenya.

One study in North America compared fertility rates in 863 married adults with idiopathic/ cryptogenic epilepsy and same sex siblings without epilepsy. Reduced fertility rates occurred in both men and women with epilepsy after but not before the onset of epilepsy. In this study, factors reducing fertility rates further were localization-related epilepsy and early age at onset(52). Dansky et al also reported that the reduced rate of fertility holds in married WWE, but did not hold in married men with epilepsy(53). Married females only had 69% of expected live-born children ($p>0.001$), compared to 100% for males. Wallace et al in UK(1998) found an

overall fertility rate of 47.1 live births/1000 women aged 15-44 years, compared with a national rate of 62.6 in the same age –group(54). The standardized fertility ratios were significantly lower between the ages 25-39 in epileptic women ($p>0.001$).

1.4.2 Menstrual disorders:

Both interictal and ictal discharges have been proposed as altering the sex steroid hormonal axis at the level of the hypothalamus and the pituitary, leading to menstrual irregularities (55, 56).

Herzog et al (56) studied 50 consecutive women with temporal lobe epilepsy. He found that 56% had amenorrhea, oligomenorrhea, or abnormally long or short menstrual cycle intervals.

Menstrual disorders are significant because they are associated with anovulatory cycles that may increase the risks for seizure frequency, infertility, migraine, emotional disorders, and female cancers(57). These factors can alter reproductive hormone levels and promote the development of reproductive endocrine disorders, especially polycystic ovarian syndrome (57).

Catamenial epilepsy

This refers to an increase in seizures around the time of the menses, either just before or during the first few days of menstruation. Catamenial seizures are thought to be related to the changing sex hormone concentrations during the menstrual cycle(58).In the study by Herzog et al, seizures exacerbation either peri-menstrually or pre-ovulatory was recorded in 71% of women with ovulatory cycles and 78% of women with anovulatory cycles reported an increase during the second half of the inadequate luteal phase. Using a two-fold cyclical increase in seizures to diagnose catamenial epilepsy, one-third of the women appeared to suffer from this disorder(59).

Anovulatory cycles tend to be associated with an increase in seizure frequency in the second half of the menstrual cycle, while ovulatory cycles can have one or two peaks in seizure frequency around the time of menstruation and/or ovulation (15).

There are also alterations in AED concentrations, as seen with phenytoin and lamotrigine, throughout the menstrual cycle (60). This cyclic pattern is often under recognized or under

acknowledged by physicians treating WWE (9).Perhaps one of the reasons is the perceived lack of treatment options.

Polycystic Ovarian Syndrome:

Polycystic Ovarian Syndrome(PCOS) refers to presence of ovulatory dysfunction, with clinical evidence of hyperandrogenism e.g. hirsutism, in the absence of other endocrinopathies including thyroid dysfunction(61).PCOS occurs in 10 to 20% of WWE compared with 5 to 6% in the general population (62).This is related to inadequate levels of follicle-stimulating hormone (FSH), whereas levels of luteinizing hormone (LH) are normal or elevated (55).

Left temporal lobe epilepsy (LTLE) is associated with significantly higher pulse frequencies of gonatrophin-releasing hormone (GnRH) secretion(62) which in turn, is associated with higher LH/FSH ratios and higher serum testosterone levels. Herzog et al (63) reported that women with left-sided interictal discharges were more likely to have PCOS than were those with right-sided discharges .PCOS has been found to be more common in women taking VPA, especially those starting VPA before the age of 20(64) .Changes in serum androgen levels have been detected before and during pubertal development in young girls taking VPA for epilepsy(65).Obesity and associated hyperinsulinemia could be implicated in the development of PCOS and hyperandrogenism in women taking VPA. It is also likely that VPA has a direct effect on ovarian androgen production, or as an enzyme inhibitor, it may inhibit the metabolism of sex steroids leading to increased serum androgen levels (66).

Studies suggest that the reproductive endocrine effects of AEDs may be reversible if the medication is discontinued. In a prospective study, replacement of VPA with lamotrigine resulted in normalization of endocrine function during a 1-year follow- up in 12 women with a previously identified endocrine disorder (PCOS or hyperandrogenism, or both) likely to be related to VPA. Serum insulin and testosterone levels returned to normal 2 months after VPA was discontinued, and the levels remained normal thereafter(66).

1.4.3 Sexuality:

EIAEDs can adversely affect sexual functioning by decreasing bioactive testosterone levels. Temporal Lobe Epilepsy (TLE) of right-sided versus left-sided origin may also be a risk factor for sexual dysfunction. The serotonin transporter protein (STP) is related to TLE and it is postulated that this transporter may play a role in altered sexual functioning in epilepsy, through serotonergic effects of AEDs (67) .

Morell and Flynn(68)studied sexual dysfunction and hormones in WWE 18-40 years with localization-related epilepsy(LRE),primary generalized epilepsy(PGE),and non-epilepsy controls. Compared to the controls, women with LRE had significantly higher sexual dysfunction scores, lower mean arousal, and higher depression scores. Mean arousal scores were also lower in the PGE group .Questions about sexual function should be part of the routine evaluation in the outpatient clinic. Available evidence suggests non-EIAEDs show more favorable profiles(69).

1.5 MENOPAUSE

Menopause tends to occur significantly earlier in women with a high seizure frequency (70). Herzog et al(71)were the first to report an association between partial epilepsy and premature menopause. Harden et al(72) also found a relationship between seizure frequency and age at menopause, while Klein and co-workers (73)found an increased frequency of premature ovarian failure in WWE. Harden et al also studied the effect of menopause and perimenopause on the course of epilepsy(74) .Of the 39 perimenopausal women,23% experienced no change in seizure frequency,13% experienced a decrease and 64% an increase, while 68% of patients with a history of catamenial seizures reported a menopausal decrease in seizure frequency.

Use of Hormone replacement therapy (HRT) during menopause is significantly associated with an increase in seizure frequency, especially in women with a history of catamenial epilepsy (70).A randomized study in 21 patients demonstrated a dose rate increase in seizure frequency with HRT(74),and should be avoided in this group.

1.6 GUIDELINES FOR MANAGEMENT OF WOMEN WITH EPILEPSY

The first international guidelines to assist physicians caring for women with epilepsy were presented in 1989(75).

The American Academy of Neurology and the American College of Obstetricians and Gynecologists recently issued evidence based practice parameters that review medical issues of concern for WWE (33). These parameters propose optimal care practices related to AED selection and management, family planning and preconceptional counseling and pregnancy management.

Other guidelines have also been developed e.g. The Scottish and the European guidelines. Despite the publication of these guidelines, care of WWE remains suboptimal.

LOCAL GUIDELINES:

Recently, the Kenyan Guidelines were launched(76), and it also addresses some aspects of women's health issues. It addresses the need for periconceptional folic acid supplementation and Oral contraception discussion.

1.7 TOOLS FOR ASSESSING QUALITY OF CARE IN EPILEPSY

There are two quality measures (indicators) for assessing care of patients with epilepsy; the QUIET (QUality Indicators in Epilepsy treatment) measures and the AAN quality measures. Both tools have measures addressing the care of Women with epilepsy.

The QUIET tool was designed to benchmark the quality of care for adults with epilepsy in primary care and general neurology clinics (77). The measures were determined by a panel of epilepsy experts and patient focus groups, using RAM process (Random Appropriateness Method). The panel appraised national clinical guidelines and systematic reviews of the literature, and then rated the appropriateness, reliability, and necessity of each quality indicator. The tool has a total of 27 measures.

The American Academy of Neurology developed quality measures (indicators) in 2009(50). These measures are based on the QUIET Indicators. Based on these indicators, AAN quality indicators were developed after a second more stringent process (Physician Consortium for Performance Improvement) (51) .The AAN measures are evidence based, and are intended to facilitate quality improvement activities by physicians. By capturing the key performance indicators, the quality of epilepsy care can be monitored, gaps in care identified and ultimately improvements made. For purposes of reporting, the measures are calculated by creating a fraction with a reporting numerator and reporting denominator.

The ANN has 8 performance measures. Measure 8 addresses Counseling for women of child bearing age with epilepsy, with the following clinical recommendation statements : WWE need to be informed on the risks of epilepsy and AEDs therapy prior pregnancy, folate supplementation, monotherapy using lower dozes when possible and proper obstetrical care(51).

Table 1 AAN Epilepsy Quality Measures

Measure	**Parameter**
Measure 1	Documentation of Seizure types and current seizure frequency(ies)
Measure 2	Documentation of Etiology of Epilepsy
Measure 3	Review of Electroencephalogram (EEG) results.
Measure 4	Review of MRI/CT scans results.
Measure 5	Querying and Counseling about AED Side effects.
Measure 6	Surgical Therapy Referral Consideration (Intractable Epilepsy)
Measure 7	Counseling about Epilepsy Specific Safety Issues
Measure 8	Counseling for Women of Childbearing Potential with Epilepsy

1.8 STUDIES ON CARE OF WOMEN WITH EPILEPSY

Despite release and publication of guidelines, several studies have found the care for WWE to be suboptimal (12-16).In many cases, primary care epilepsy management is confined to medication review, with referral to regional specialist centers for diagnosis and changes in medication.
In the study by Bell et al (15), on "Information recalled by women taking anti-epileptic drugs", he identified gaps in the care given to WWE. Only 43% had received advice on the AED/OCP interaction, with no statistical difference between those on EIAED's and non-EIAEDS. Pre-

pregnancy planning had only been addressed in 40% of the women of reproductive age, with no significant statistical difference between those on monotherapy vs. polytherapy. Only 38% of the WWE were aware of the need for folic acid supplementation, with no significant difference between those on EIAEDS and non-EIAEDs.

Table 2 ***Summary of studies done to assess the care of WWE***

Study	**Location**	**Design**	**N**	**Results**
Seale CG, et al.1998 Analysis of prenatal and gestational care given to WWE.	Stanford University	Retrospective	155 charts 132 women	75% of patients on AED's had documentation of folate supplementation
Crawford P et al.1999 Gender difference in management of epilepsy: What women are hearing.	Britain	Cross-sectional	1855	51% no advice on OCP/AED interaction, 34% no preconception advice
Fairgrieve SD et al. 2000 Population based, prospective study of the care of women with epilepsy in pregnancy.	Former Northern Health Region	Prospective	200	38% preconceptional counseling, 11% folate appropriately, 36% babies received vitamin K 84% on monotherapy
Bell GS et al. 2002 Information recalled by women taking AED for epilepsy: a questionnaire study.	London	Cross-sectional	795	43% advised on OCP 40% advised on preg.planning 38% aware on folic acid 48% advised on teratogenicity
Margitta et al.2005 "Management of Women with Epilepsy: Are Guidelines Being Followed?	Norway	Retrospective	112	77% preconception counseling,5% advised on bone health,74% advised on folic acid71% advised on OCP

Fairgrieve et al. surveyed 300 pregnant WWE. In this prospective study, only 38% had received preconceptional counseling, with nearly 25% reporting contraceptive failure, and fewer than 11% took appropriate doses of folate(15). Crawford et al (1999) interviewed 1855 WWE about the information they received from healthcare professionals on contraception and pregnancy.

Only 49% had received advice about possible drug interactions between AED and contraceptives, while 34% had not received any advice or discussed pregnancy with their healthcare provider. Only 7% had received advice about the teratogenic effects of AEDs (14).

In the study by Kampman M et al (78),despite active dissemination of guidelines, 23% of the women had not received information on pregnancy related issues, with only 5% having information on bone health. Although 74% of the questionnaire respondents had information on the need for folic acid periconceptionally, less than one third had received advice on the need for folic acid supplementation if on EIAEDs.

Seale et al(12) analyzed the prenatal and gestational care given to WWE. In this retrospective study, only 75% of patients on AEDs had documentation of folate supplementation, with only 41% receiving vitamin K supplementation in the final month. There were omissions of appropriate vitamin supplementation, genetic counseling, and drug monitoring level.

1.9 KNOWLEDGE OF PRACTITIONERS

Studies published in last two decades have consistently demonstrated a substantial lack of knowledge by both health professionals and patients in the areas of health of WWE (6, 9-11). Morrell et al.(9)reported the results of the Epilepsy Foundation of America's survey of healthcare professionals on their knowledge about women's issues in five areas: hormone-sensitive seizures, fertility, pregnancy and contraception, sexuality, and bone density. Of the 3,535 respondents, only 37% knew when seizures were likely to occur during the menstrual cycle, and only 16% were aware that seizures are associated with reduced fertility. More than half the respondents were not aware of the association of bone disease and AED’s, demonstrating great deficiencies in knowledge.

Attendees of the American College of Physicians 2003 annual meeting were invited to complete a computerized version of the Knowledge of Women’s Issues and Epilepsy (KOWIE-II) questionnaire(79),a validated tool. Only 24% understood the effects of endogenous steroid hormones on seizure threshold, while less than 40% knew that epilepsy is associated with an increased incidence of female sexual dysfunction. Mamta Bhat et al also used the KOWIE-II

to assess "Knowledge and practice profile of obstetricians regarding epilepsy in women in Kerala state, India". One third of the respondents knew that estrogen has a proconvulsant effect whereas progesterone has an anticonvulsant effect. Less than 30% of the participants correctly understood the higher incidence of sexual dysfunction or infertility in WWE(80).

In a recent survey done on residents in Calabar University-Nigeria using the KOWIE-II by Kelechi et al,(81)only 18% of the respondents new the effects of hormones on seizures. While 69% knew the association between AED and OCP, only 43% understood the effect of AED on bone health. As is evident, the deficiency of quality care and the lack of awareness among health care providers go hand in hand. In chronic conditions like epilepsy, the time between the care provided and its outcome can be long, and a poor outcome (e.g., major malformations in offspring or oral contraceptive failure) does not occur every time an error or deficiency occurs in the provision of that care. Hence in such situations, details of practice (process data) provide more sensitive measures of quality than do outcome data.

Table 3 ***Summary of studies done to assess knowledge using KOWIE II questionnaire:***

Study	Location	Tool	n	Specialty	Results
Long et al 2003	San Diego	KOWIE-II	202	Physicians	24% hormones on seizure, 77% AED/Bone disease, 71% AED/OCP,
Bhat et al 2011	Kerala/ South India	KOWIE-II	97	Obstetricians	40%hormones& seizure, 45%AED/Bone health, 94%AED/OCP,
Sunmonu et al 2012	Cameroun	KOWIE-II	55	Neurologists Internal Med	<50%AED/Bone health, 25% on effect of seizures on sexuality
Kelechi et al 2012	Calabar , Nigeria	KOWIE-II	72	Obs/Gyne Int. Medicine Fam. Medicine	18%hormones &seizure, 43% AED/Bone health, 69% OCP/AED, 83% folic acid

1.10 TOOLS FOR ASSESSING KNOWLEDGE OF HEALTH CARE GIVERS

Various questionnaires have been developed to assess the knowledge of practitioners on care of Women with epilepsy (9, 11, 13, 79). Morell et al (9) designed a questionnaire with focus on: hormone-sensitive seizures, fertility, pregnancy and contraception, sexuality, and bone density. Krauss et al also designed a questionnaire for neurologists and obstetricians with focus on issues related to AED and OCP (13) . Long et al designed the KOWIE II (Knowledge of Women's Issues in Epilepsy) questionnaire(79) .

The KOWIE II questionnaire is a ten item instrument used to assess the knowledge of women related issues in epilepsy among health care professionals. The questionnaire has two parts; the first part assesses knowledge of facts about epilepsy and women health, second part deals with facts about pregnancy and epilepsy (Long et al 2002).The tool includes questions pertaining to the effect of seizures and AEDs on OCP, bone health, sexual function, hormones and pregnancy. The validity and reliability of the KOWIE-II had been previously established (82).The KOWIE II questionnaire had been successfully employed by some researchers in Africa i.e. Kelechi O et al (78) and Sunmonu T et al(79).

1.11 LOCAL STUDIES

In Africa as a whole, most studies done have focused on the epidemiology, psychosocial impact and Knowledge, attitude and practice of patients with the disease. Few studies have been done to assess knowledge of practitioners with regards to management of WWE (81, 83).
However no studies have been published so far, assessing the quality of care of WWE.
In the local setting, general practitioners play an important role in the diagnosis and treatment of epilepsy. This is because, there are relatively few specialists (Neurologists), meaning the majority of patients are on long-term management under the care of general practitioners or general physician at best.

1.12 ASSESSMENT OF QUALITY OF CARE

According to Avedis Donabedian, quality of care can be classified under three categories: "structure," "process," and" outcome." (84)

Structure denotes the attributes of the settings in which care occurs. This includes the attributes of material resources (such as facilities, equipment, and money), of human resources (such as qualifications of personnel), and of organizational structure (such as medical staff organization). Process denotes what is actually done in giving and receiving care. It includes the patient's activities in seeking care and carrying it out as well as the practitioner's activities in making a diagnosis and recommending or implementing treatment. Outcome denotes the effects of care on the health status of patients and populations. Improvements in the patient's knowledge and salutary changes in the patient's behavior are included under a broad definition of health status, and so is the degree of the patient's satisfaction with care.

From the above definition, quality of care of WWE of reproductive age revolves around the structure (Knowledge of health practitioners on issues of WWE), process (information given by the health practitioner to patients), and outcomes (patients' awareness on issues of WWE)

2.0 RATIONALE AND JUSTIFICATION

Epilepsy is one of the most common neurological disorders, and Women with epilepsy are a unique group with specific health needs.

Several studies' done elsewhere had shown gaps in the care of Women with Epilepsy, with lack of knowledge on the part of caregivers.

Few studies in Africa had addressed this issue of knowledge of caregivers' on Women with Epilepsy, with no local data available. No studies had been done locally, and indeed no studies had been published from Africa, addressing the issue of care of Women with Epilepsy.

This study sought to determine the level of the care offered to Women with Epilepsy, with the aim of improving quality of care and even improve medication adherence.

The results of this study would also inform of any gaps in the health care, and be useful in the area of policy making for Women with Epilepsy.

3.0 RESEARCH QUESTION AND OBJECTIVES

RESEARCH QUESTION

What is the quality of care offered to WWE of reproductive age, and Knowledge of residents on women's issues in epilepsy at The Kenyatta National Hospital?

OBJECTIVES

3.1 BROAD OBJECTIVE

The broad objective was to determine the level of care of WWE of reproductive age, and evaluate the knowledge of resident doctors' on women's issues in epilepsy at the Kenyatta National Hospital

3.2 SPECIFIC OBJECTIVES

The Specific Objectives were:

1. To document the numbers, types and dosages of anti-epileptic drugs used in Women with epilepsy of reproductive age.
2. To determine the proportion of WWE of reproductive age on folic acid supplementation.
3. To determine the proportion of Women with epilepsy of reproductive age informed on issues of pregnancy, contraception and bone health.
4. To determine level of conformity(on information given to Women with epilepsy) to the eighth AAN epilepsy quality measures
5. To assess the knowledge of residents in Internal Medicine and Obstetrics/Gynecology on issues of Women with epilepsy.

4.0 STUDY DESIGN AND METHODOLOGY

4.1 STUDY DESIGN

The study was a cross-sectional descriptive study.

4.2 STUDY SITE

The study was conducted at the Kenyatta National Hospital, which is a tertiary, teaching and the main referral hospital for East and Central Africa, with a bed capacity of over 1,800.
The site was at the Neurology outpatient Clinic. The Neurology clinic is held on Mondays, from8 am to about 1pm, and caters for patients above 14 years who have neurological complaints.

The clinic is run by both consultants (Neurologists) and residents (from Internal Medicine). During the clinic days, health talks run by a nurse are given to new patients, and old patients addressing the need for medication adherence and safety measures. The health talks are on individual basis and not group talks. Health talks for women with epilepsy are sometimes given, but these are erratic as they are not held every Mondays, and not all women may be educated on a single clinic visit.

4.3 STUDY POPULATION

There were two study populations;

1) Women with epilepsy within the reproductive age (15-49) attending the neurology clinic.
2) Residents who offered care to WWE of reproductive age (department of Clinical Medicine and Therapeutics, and Department of Obstetrics and Gynecology, UoN) were also invited to participate in the study to assess their knowledge on issues of WWE.

4.4 SAMPLE SIZE CALCULATION AND SAMPLING METHOD

The minimum sample size was 111 as calculated by the Formula for finite population

(Less than 10,000).

$$n' = \frac{NZ^2P(1-P)}{d^2(N-1)+Z^2P(1-P)}$$

Where n' = sample size with finite population correction,

N = size of the target population (160 for a period of 4 months)

Z = Z statistic for 95% level of confidence = 1.96

P = Estimated proportion (women who received information on folic acid supplementation 0.38 (Bell et al)

d = margin of error = 5%

n = **111**

The target population was estimated at 160 over a period of 4 months, with an average of 10 every Monday.

One hundred and fourteen patients were recruited through **consecutive** sampling, over a period of three and a half months, from mid December 2014 to March 2015.

The survey for residents was population based, and all the residents in the departments of Clinical Medicine and Obstetrics (currently respectively) were eligible to participate in the study. For logistical purposes, we targeted at least 80% of all the residents (currently**228**). A total of 160 residents (82 from Internal Medicine, 78 from Obstetrics& Gynecology) participated in the study.

4.5 PATIENT SELECTION

4.5.1 Case Definition

Women with a diagnosis of epilepsy (as documented in the file, based on the WHO criteria), within the reproductive age (15-49) years, attending the neurology clinic.

4.5.2 Inclusion Criteria

- WWE between the ages of 15 to 49
- Patients having attended more than one clinic visit
- A written and informed consent from the patient.

4.5.3 Exclusion Criteria

- Where there was Language Barrier (to Kiswahili and English)
- Those who were unable to comprehend the study(cognitive impairment)
- Those on permanent methods of contraception (i.e. assumed as no longer reproductive)
- Those who declined to give consent

4.5.4 Inclusion Criteria for health care professionals

- All residents(post graduate Masters students) in Clinical Medicine and Obstetrics and Gynecology
- A duly signed written and informed consent from the residents

4.6 STUDY PROCEDURES

After approval was sought from KNH/UoN Ethical Review Committee, the research assistant was trained on how to interview the patients and fill the study proforma. This was done before data collection began.

Each week, a list of all female patients booked for the clinic, with a diagnosis of epilepsy and in the identified age group was drawn up by the Principal Investigator. From the list, consecutive sampling method was used to obtain 8 to 10 patients on each clinic day, until the sample size was reached.

The selected patients had the study explained to them, and those who met the inclusion criteria and agreed to participate, were requested to sign the informed consent form. If no consent was given, consecutive sampling was repeated until the desired number was achieved.

Once the consent was given, the patients were interviewed as per the proforma after their clinic review (Appendix 3).

STUDY PROFORMA

We collected data using a study proforma. This proforma was based on the Local Kenyan guidelines(76) , and the 2009 AAN guidelines and epilepsy quality measures(51). The proforma had 3 sections; patients bio data and disease history, current prescriptions, and patient awareness section. The section on patient awareness focused on: folic acid, AED/OCP interaction, pre conception counseling and bone health.

Although various questionnaires assessing the care of women with epilepsy had been designed in previous studies(14, 16, 78),they were not used for this study as the information included in AAN guidelines and quality measures had since been updated from the time the questionnaires were designed.

We benchmarked the proforma on the AAN guidelines and quality measures because they are evidence based.

The study proforma was translated into Kiswahili, by a Swahili expert/lecturer.

The proforma was administered by the PI and the research assistant. Each of the questions was read in the language best understood by the patient, either English or Kiswahili.

Patient socio-demographics

Brief targeted history was taken to obtain information on: socio-demographics, parity, disease duration, seizure control and contraceptive use. Disease duration was calculated from age of first seizure.

Contraception use was limited to the previous one year, and was grouped into OCP's, condom, IUD's and injectables.

The patients' files were reviewed to obtain information on the type of epilepsy

This information was entered into the study proforma

4.6.1 Documentation of Anti-epileptic drugs and folate prescriptions

The patients' exit prescriptions was also reviewed and the following information documented:

- Numbers of antiepileptic drugs
- Type and dosages of current antiepileptic drug/s.
- Folic acid supplementation and dosage.

Information obtained was filled into the study proforma for each patient.

4.6.2 Patients' awareness on issues of pregnancy, contraception and bone health

Patients were then assessed on their awareness on the following:

- Need for preconception counseling before planning to conceive
- Need for folic acid supplementation.
- Oral contraception and antiepileptic drug interaction.
- Antiepileptic drug effect on bone health

Information was entered into the same proforma, from patients who could understand English and/or Kiswahili. Those who responded 'yes' to the questions were further asked to specify the source of information (Appendix 3).

All proformas filled were collected and kept by the Principal Investigator after each clinic

4.6.3 Assessment of Conformity to the eighth AAN Quality Measure

This was determined by calculation of the performance measure based on the AAN Quality Index. The performance measure was calculated by generating a performance numerator (PN);

defined as all women who had been counseled about epilepsy and how its treatment may affect contraception and pregnancy, and a performance denominator (PD); defined as all women with epilepsy eligible for counseling.
This fraction (i.e. PN/PD) was then multiplied by 100 to obtain the performance measure.

4.6.4 Assessment of Knowledge and Practice of Healthcare Professionals

This part of the survey was limited to residents in the departments involved in the management of women with epilepsy. These included Obstetrics and Gynecology and Clinical Medicine. The contacts of the residents were obtained from their respective departments. The residents were approached during break periods, or during conferences, while on non-emergency duty at the hospital.

The study was explained to them by the PI .Those who gave consent were asked to answer to the KOWIE II questionnaire (Appendix 6).The residents were required to respond 'True', 'False', or 'Don't Know' to the 10 statements constituting the KOWIE II questionnaire. Residents were also asked to fill in their profession, years of practice and year of residency as additional questions. The questionnaires were filled "on spot' .The average amount of time for filling the questionnaire was 15 minutes. All questionnaires filled were collected and kept by the PI. Confidentiality was observed at all times.

4.6.4KOWIE II QUESTIONNAIRE

We used the KOWIE II questionnaire to assess the residents' .The KOWIE II questionnaire is a ten item instrument used to assess the knowledge of women related issues in epilepsy among health care professionals(79).

The questionnaire has two parts; the first part assesses knowledge of facts about epilepsy and women health, second part deals with facts about pregnancy and epilepsy(79).
Long *et al*. developed the KOWIE-II questionnaire to ascertain what healthcare professionals knew about issues pertaining to WWE. The tool includes questions pertaining to the effect of seizures and AEDs on OCP, bone health, sexual function, hormones and pregnancy.

The validity and reliability of the KOWIE-II had been previously established(82) .
The KOWIE II questionnaire had been successfully employed by some researchers in Africa i.e. Kelechi O et al (78) and Sunmonu T et al (79).

4.7 DATA MANAGEMENT AND ANALYSIS

Data was cleaned, verified and coded into a Microsoft access form before being exported to a Microsoft excel database.
Statistical Analysis was done using MINITAB version 16.Means and standard deviations were computed for continuous variables, while categorical data was summarized as percentages.

The AEDs prescriptions were described as proportions of monotherapy vs polytherapy of the total prescriptions. Folic acid supplementation was calculated as a percentage of the number of WWE on folic acid during the study period.Patient awareness on issues of pregnancy, contraception and bone health was described in detail as percentages/proportions for each component.Compliance to the American Academy of Neurology quality measures was assessed using the AAN quality index/performance calculation

Doctors knowledge on aspects of WWE was also be described in detail as percentages for each item of the questionnaire.

4.8 QUALITY ASSURANCE

The research assistants were trained on how to administer the study proforma, the same way to every patient they interview.
The KOWIE-II questionnaire is a validated tool. It had also been used successfully in other African Countries.

5.0 ETHICAL CONSIDERATIONS

Approval was sought from the Department of Clinical Medicine and Therapeutics and KNH/UON Ethics department prior to commencing the study.

A consent explanation was carried out. The study was only carried out on patients and residents who gave written informed consent.

Failure to give consent did not lead to denial of care for the patients.

Participants were allowed to opt-out from the study without prejudice.

All information gathered was treated with utmost respect and confidentiality, and used only for the intended purpose. The study findings were communicated to the department and residents for clinical decision making. The study findings will also be communicated to the Head of Medicine Department, Kenyatta National Hospital, for clinical decision making (policy making).

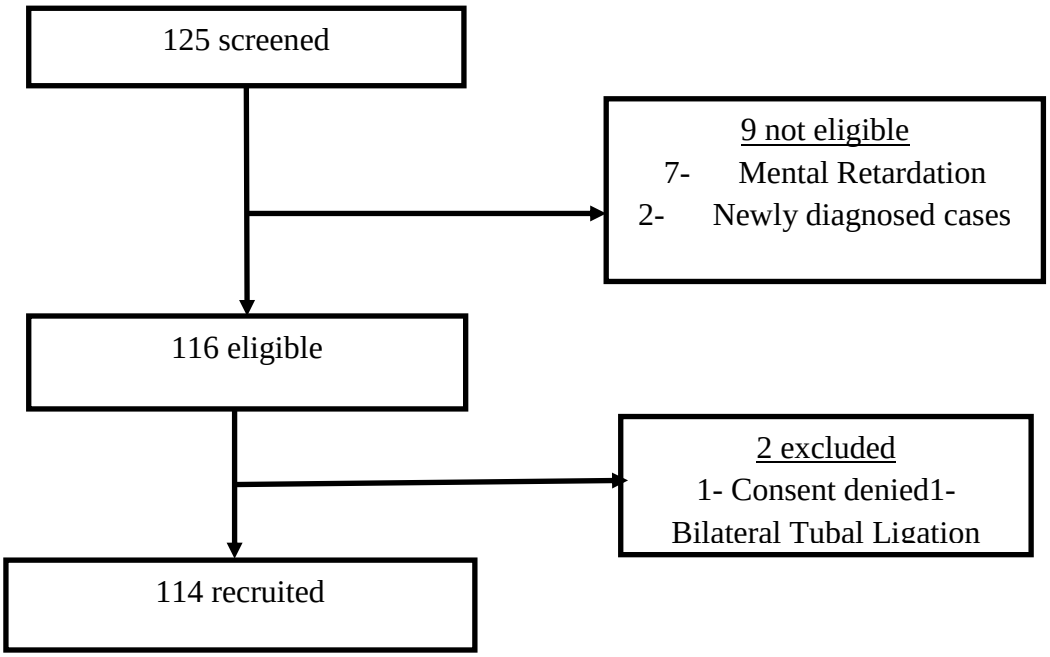
6.0 RESULTS

This was a study comprising 2 different samples: Patients and Health care providers (Residents in Clinical Medicine and Obstetrics and Gynecology) .Each sample result is presented separately.

6.1 PATIENT SCREENING

Patient screening started on 15th December 2014 and was completed on 30th March 2015. A total of 125 patients were consecutively screened in the outpatient Neurology clinic during the three and a half month period. One hundred and sixteen met the study inclusion criteria; 2 were excluded and thus 114(84.4 % of total screened) were recruited into the study as shown in Figure 1 below. Nine were excluded for the following reasons: 7 had Cognitive dysfunction (Mental Retardation), and 2 were newly diagnosed cases. Of the eligible patients, 2 were further excluded because one had undergone bilateral tubal ligation and the other denied consent.

Figure 1: Flow Diagram for the enrolled study patients (WWE of reproductive age):

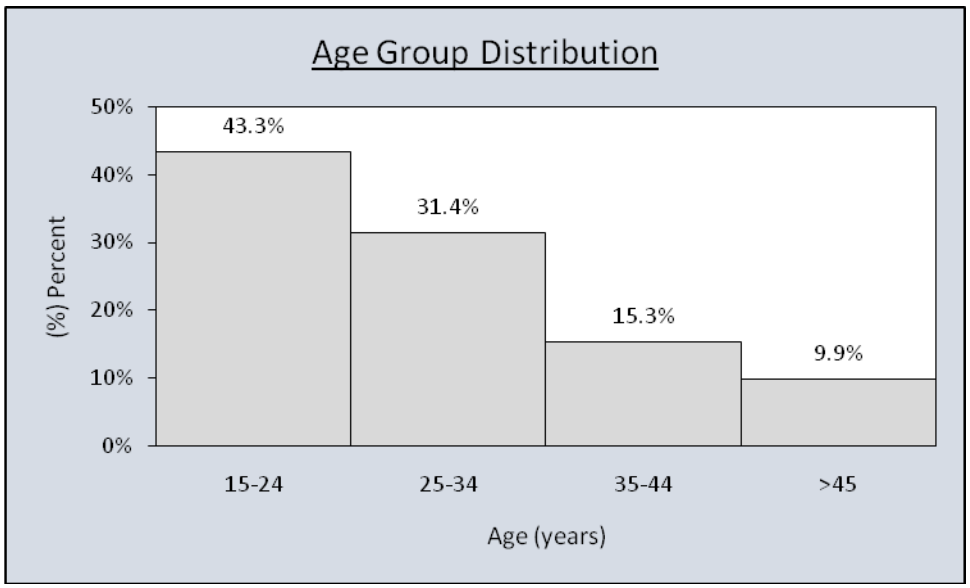


6.2 SOCIO-DEMOGRAPHICS AND CLINICAL CHARACTERISTICS OF STUDY PATIENTS

The age distribution for the study patients are shown in Figure 2

The median age of the study subjects was 28 years, with a mean of 28.78 +/- 10.2.

Figure 2: Age distribution for the study patients



As shown in Table 4, most of our study patients were single (71.17%).

Majority (82 %) had attained secondary education and above. Forty seven percent were on some form of gainful employment. Students comprised 25.69 % of all those unemployed.
Majority of the study participants had been attending the clinic for more than two years at the time of the study.

Epilepsy history.

The median duration of epilepsy was 8 years (interquartile range of 11 years), with a mean duration of 10.84 (+/-8.9) years. Forty four patients had E.E.G (Electroencephalogram) in their records. The commonest E.E.G abnormality was generalized seizures at 59%, followed by focal seizures at 24%

Table 4: Socio-Demographics of the study patients

Age n= 114	
Mean age (SD)	28.78 (10.20)
Median (IQR)	28.00(14)
Education n = 111 , %	
≤ Primary	20 (18.22%
Secondary	52 (46.85%)
Tertiary	39 (35.14%)
Marital status n = 114 ,%	
Single	81 (71.05%)
Married	26 (22.80%)
Divorced/separated/widowed	7 (6.14%)
Occupation n=114, %	
Gainful employment	54 (47.36%)
Student or unemployed	60 (52.63%)
Duration of illness years	
Median(IQR)	8.0(11)
Mean(SD)	10.84(8.997)
Duration of clinic attendance, n=114 %	
<1 year	19 (16.67%)
1-2 years	14(12.28%)
≥2 years	81(71.05%)

Reproductive history & Contraception use.

As shown in Table 5, thirty nine percent of the respondents had children and another 4.5 % were gravid. A small proportion was on contraception, the most frequent method used being hormonal method.

Table 5: Reproductive history and contraception use of the study patients

Reproductive History Parity n=111 %	
Parous	44 (39.6%)
Nulliparous	62 (55.9%)
Gravid	5 (4.5%)
Contraception Use n = 111	
On contraception	19 (17.1%)
Method of Contraception n = 19	
OCP	26.67%
Depo- Provera	20%
IUCD	20%
Condom	13.3%
Other	20%

6.3 NUMBERS AND TYPES OF AEDs USED IN WWE OF REPRODUCTIVE AGE

6.3.1 Monotherapy vs Polytherapy

As shown in Table 6, majority of the study patients were on monotherapy at 61.3 %.

Of the gravid patients, majority were also on monotherapy as shown (3 on carbamazepine, while 1 was on sodium valproate).

Table 6: Antiepileptic drug use in study patients (WWE of reproductive age)

	Overall	**Non-pregnant**	**Pregnant**
N	114	109	5
Monotherapy	70 (61.3%)	66 (61%)	4 (80%)
Polytherapy	44 (38.7%)	43 (39%)	1 (20%)

6.3.2 Types and Frequencies of Monotherapies

Table 7 highlights the types of monotherapies. The commonest drug was carbamazepine, at a frequency of (82.4%), followed by valproic acid. Lamotrigine had the lowest frequency at 1.4%. Three out of the four gravid WWE were on carbamazepine, while one was on valproic acid.

Table 7: Types and frequencies of monotherapies used by study patients

Monotherapy type(n= 70)	**Frequency (%)**
Carbamazepine	81.4%
Sodium Valproate	12.9%
Phenobarbital	2.9 %
Phenytoin	1.4%
Lamotrigine	1.4%

6.3.3 Types and Frequencies of Polytherapy

Of the patients on polytherapy, majority (**74.4 %)** were on dual therapy, **23.04 %** were on triple therapy, while **2.56 %** were on four drugs. Table 8 highlights the types of polytherapy combinations. The most frequent was carbamazepine/valproate at 36.36%.

Table 8: Types and frequencies of polytherapy used by study patients

Polytherapy Types (n=44)	**Frequency %**
Carbamazepine/Valproate	36.36%
Carbamazepine/Phenytoin	20.45%
Carbamazepine/Lamotrigine	6.82%
Carbamazepine/Phenobarbital	4.55%
Phenobarbital/Phenytoin	4.55%
Carbamazepine/Valproate/Clonazepam	13.64%
Carbamazepine/Valproate /Lamotrigine	4.55%
Others	9.10%

6.4 PROPORTION OF STUDY PATIENTS' ON FOLIC ACID SUPPLEMENTATION

Most of the study patients were on folic acid supplementation, (60.36%), at a dose of 5mg per day. Of the gravid WWE, four out of the five were on folic acid supplementation.

6.5 INFORMATION RECEIVED BY WOMEN WITH EPILEPSY OF REPRODUCTIVE AGE

Table 9: Proportion of study patients informed on issues of pregnancy, contraception, bone health.

Proportion of WWE informed on : n= 111	**n (%)**
Need for folic acid supplementation during pregnancy	19 (**17.1**%)
Need to see a doctor when planning to conceive	34 (**30.9**%)
Effects of AEDs on Oral contraception	16 (**14.4**%)
Effects of AED on Bone Health	7 (**6.3**%)
WWE who have received preconception advice	11 (**9.9**%)

Table 9 summarizes the proportion of study participants who had received information on pregnancy related issues, contraception and bone health.

The overall awareness level was low. Majority of the WWE (>80%) had not been informed on the need for folic acid and that AEDs could interact with OCP.

As shown in Table 9, less than 10% had received preconception counseling and bone health advice. Those who had attended the clinic for ≥2 years were more likely to receive preconception counseling and bone health advice than those at the clinic <2 years. Majority of those who had been informed were > 30 years (71%, n= 5).

About 31% of the patients surveyed had been counseled on the need to see a doctor when planning to conceive.

6.6 PERFORMANCE MEASURE BASED ON AAN QUALITY INDEX

The performance measure (quality of care) based on AAN Quality Index was calculated as follows:

PN (Performance Numerator) * 100

PD (Performance Denominator

PN = All WWE who had been counseled about epilepsy & how its treatment may affect contraception & pregnancy

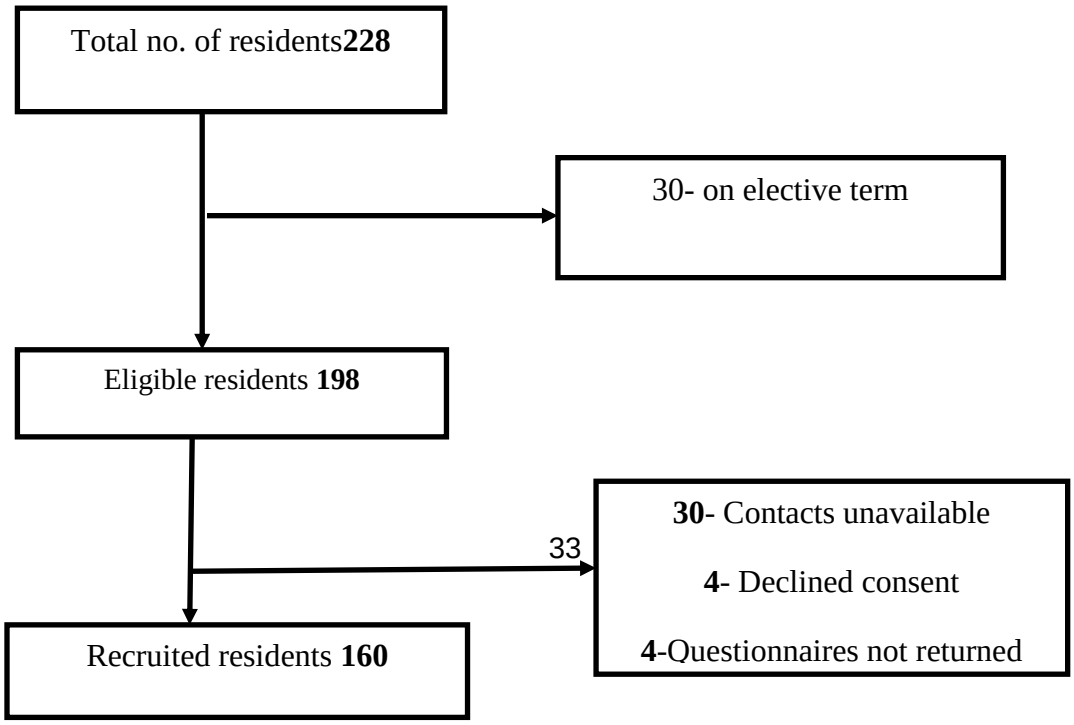
= 23 * 100 (A total of 23 WWE had received some form of pregnancy related advice)
114

= 21 %. Performance measure for counseling of WWE at the neurology clinic was at **21%**

6.8 KNOWLEDGE OF RESIDENTS IN CLINICAL MEDICINE AND OBSTETRICS AND GYNECOLOGY ON ISSUES OF WOMEN WITH EPILEPSY

A total of 160 Residents in the departments of Clinical Medicine and Obstetrics & Gynecology participated in the study. About 30 residents (from obstetrics/gynecology) were out on elective program. Of the eligible residents, contact was unavailable for 30 of them, while 4 declined to consent. We further excluded 4 from the final analysis for failure of returning the questionnaires. The overall response rate was 80.8%

Figure 4: Flow diagram for participating residents



DEMOGRAPHICS OF THE RESIDENTS.

Table 10 summarizes the demographics of the residents. Distribution between Clin. Med and Obs/Gyne was almost equal (51.2% & 48.8% respectively). Most of the participants were in their 1st year of study (32.5%), and majority had been in practice for 3-6 years since internship (48.75%, n= 78).

Table 10: Demographics of participating residents (Clin Medicine & Obs/Gyne)

Residency Area, n %	
Clin Medicine	82 (51.2%)
Obs/Gyne	78 (48.8%)
Years of Practice (since internship) n %	
3-6	45(28.13%)
6-9	78(48.75%)
≥10	37(23.13%)
Year of Residency n %	
1	52(32.5%)
2	37(23.13%)
3	31(19.38%)
≥4	40(25%)

The overall response rates for each of the ten questions in the KOWIE II questionnaire are presented in Tables 11 & 12 below.

The reduction of efficacy of oral contraceptive pills on AED usage was widely known by the residents (92.5%). Similarly, 80% correctly knew about the association of AEDs and osteomalacia. Fewer participants understood the higher incidence of sexual dysfunction in WWE, and only 35% knew that estrogen has a pro convulsant effect whereas progesterone has an anticonvulsant effect.

Table 11: Awareness of facts about epilepsy and women's health, adapted from KOWIE II questionnaire. (The bold figures represent the correct responses)**.**

Statement N=160	True	False	Don't Know
"During the menstrual cycle, endogenous estrogen has been found to be a proconvulsant, while progesterone has anticonvulsant properties."	56 (**35.0%)**	30 (18.8%)	74 (46.3%)
"Women with epilepsy have a higher incidence of sexual dysfunction compared to women without epilepsy"	100 **(62.5%)**	33 (20.6%)	27 (16.9%)
"Enzyme-inducing AEDs may reduce the effectiveness of various contraceptives."	148 **(92.5%)**	8 (5.0%)	4 (2.5%)
"Some AEDs are associated with osteomalacia (reduced bone mass)."	128 **(80.0%)**	5 (3.1%)	27 (16.9%)

Table 12: Awareness of facts about pregnancy in women with epilepsy, adapted from KOWIE-II questionnaire. (The bold figures represent the correct responses)

Statement N=160	**True**	**False**	**Don't Know**
"The best AED during pregnancy is one that is most appropriate for the patient's seizure type and/or syndrome."	63**(39.4%)**	84(52.2%)	13(8.1%)
"Women with epilepsy should stop taking their AEDs when they become pregnant."	8 (5%)	152**(95.0%)**	0 (0%)
"Taking folic acid before & during pregnancy may reduce teratogenesis in children born to women with epilepsy taking AEDs."	152**(95.0%)**	6(3.8%)	2(1.3%)
"Vitamin K may reduce the risk of newborn hemorrhagic disorder associated with certain AEDs."	129**(80.6%)**	7(4.4%)	24(15.0%)
"The majority of women with epilepsy have healthy children."	137**(85.6%)**	7(4.4%)	16(10.0%)
"Most women taking AEDs can safely breast-feed."	121**(75.6%)**	22(13.8%)	17(10.6%)

The residents were knowledgeable on most aspects of pregnancy and epilepsy. Most residents knew that the majority of the WWE have healthy children (85.6%). A common knowledge was that teratogenesis could be prevented by using folic acid during pregnancy (95%), and that WWE should continue taking their AEDs during pregnancy (n=152, 95%. However, the AED most suited for the seizure type/epilepsy syndrome was considered to be the best during pregnancy by only 39.4% (n=63) of the residents.

7.0 DISCUSSION

This is, to our knowledge, the first study in Africa to assess the level of care offered to WWE of reproductive age.

The aim of this study was to determine the quality of care offered to WWE of reproductive age, based on the Kenyan and AAN guideline recommendations of counselling and specific prescription patterns. The results suggests that the prescription patterns are in relative conformity with the recommended practice, but awareness among the patients is generally poor.

Indeed disparities in adherence to quality indicators according to specialists involvement have been shown in the care of other chronic neurological conditions such as multiple sclerosis and Parkinson's disease(85).

The study population was generally young, with demographics similar to the earlier study by Kariuki et al on fertility rates among WWE of child bearing age(86)

Prescription patterns

In this study, most of the patients were on monotherapy (61%), predominantly carbamazepine. Current guidelines recommend use of monotherapy for WWE of reproductive age, at the lowest effective dose to avoid teratogenicity associated with AEDs during conception(34).

Valproate use, which is associated with spinal defects (85, 86), was the second most common monotherapy. This has an implication in the safety of pregnancies in this population. Lamotrigine, which is thought to be a safer drug, was the least prescribed, at a rate of 1.5% as monotherapy, but featured strongly as an 'add' on drug. We also did not survey any patient on levetiratecam, a safer drug, either as monotherapy or polytherapy. Perhaps cost and availability might be a limiting factor, when it comes to choosing lamotrigine or levetiracetam as monotherapy in our set up.

Carbamazepine has a relatively mild teratogenic profile (associated with cleft lip and palate), with studies approximating the frequency at ~ 0-9-1%, similar to that of lamotrigine (35, 87). The cost of carbamazepine is also comparatively cheaper than lamotrigine or levetiracetam (tablet of carbamazepine is Ksh. 25/-, lamotrigine Ksh. 100/-.)The doses of carbamazepine in our

study were generally low, with the commonest being 400mg /day either as divided or a single dose, which is usually a tolerable dose with minimal side effects.

Five of the study patients were gravid (4.5%) during the study. Majority (4 out of 5) were on monotherapy (with three on carbamazepine, and one on valproate). One was on polytherapy at the time of conception. Monotherapy, with 'less teratogenic drugs' is encouraged in pregnancy to reduce risks of congenital malformations (34).

Our figure of monotherapy rate is comparatively higher than some recent publications. In the study of antiepileptic drug use in women of child bearing age by Meador et al (88), the monotherapy rate was at 53%,whilea similar study to ours done in the UK by Crawford & Hudson, the rate of monotherapy was 51%(10). Perhaps our relatively smaller sample size might explain the discrepancies.
Recently published studies show increased use of lamotrigine and levetiracetam as monotherapies, compared to carbamazepine and valproic acid.(88)

The polytherapy rate, at 39% was similar to previously published studies(10, 88).Valproic acid featured strongly as an 'add' on drug, both at dual and triple combinations with our commonest polytherapy combination being carbamazepine/ valproate at 36%.

It is not clear if this choice of polytherapy is entirely due to cost and drug availability, or lack of knowledge on the care givers part .Recent publications have shown decreased use of valproic acid, as monotherapy and polytherapy (88).

Use of valproate has strongly been discouraged in WWE of child–bearing age, either as monotherapy or polytherapy because of its relatively higher teratogenicity profile. Valproic acid has been associated with 1-2% risk of neural tube defects , with some studies reporting that daily doses of valproic acid greater than 1g/day carry a greater risk of spina bifida and other malformations(87, 89). If valproate has to be used, the lowest effective dose should be employed, as valproate teratogenicity is dose-dependent (35).

The combination of Carbamazepine/Phenytoin, at 20% of the polytherapies likely reflects a lack of evidence- based medical data to inform and direct prescriptions. This combination has little pharmacological basis, as the drugs would not be synergistic.

Another observation was that a number of those on polypharmacy had not reached the maximum dose of their first drug. It is plausible that this may be due to drug side effects (especially carbamazepine which causes drowsiness) or a lack of knowledge on prescribers' part.

Factors that may affect AED drug choice by the prescribing practitioner include efficacy, approved indications, availability, cost, toxicity profile, past medical history, drug interactions and co-morbidities (e.g. HIV disease).
Such factors may make the drug choice for an individual patient complex. Being a tertiary hospital in a resource limited setting, choice of therapy is most likely influenced by drug availability, affordability with efficacy in mind.

Folic Acid supplementation.

In our study, 60% of the patients were on folic acid supplementation, at a dose of 5 mg daily. An earlier study on fertility rates among WWE in the same setting by Kariuki J et al 2007, found a folic supplementation rate of 17% (86). His basis of establishing supplementation use was based on patient response and was not backed by prescription analysis. This may account for the difference.
Most (95%) of the residents were well informed on the need for folic acid supplementation before and during pregnancy. However, there was still a significant figure not on folic acid supplementation. It is recommended that WWE of reproductive age should supplement folic acid to prevent birth defects (39%)
Recently published data by Moura et al from Boston, showed only 29% patients were on folic acid despite presence of guidelines and quality measures(90), indicating that this is a global problem.

The dose of folic acid supplementation used was 5mg daily, which is the tablet available locally. There is insufficient data addressing the recommended dosing of folic acid : some literature recommend 2-4 mg (91), while others favor the dose of 5 mg(35).

An observation in this study is that there was a discrepancy between the outlined process of care (only 19 % had been counselled on the need for folic acid), and the outcome variable (60% were actually on folic acid).Whether this can be attributed to increasing time constraints on an out-patient clinic, or lack of awareness of the guidelines recommendation on counseling is not clear.

Our study did not set out to check for serum folate levels and determine any deficiencies in those on enzyme inducing AEDs and on no supplementation. However, from previous studies, deficiencies have been noted on those not on folic acid and on Enzyme inducing AEDs, increasing the risk of fetal anomalies(78).

Awareness on Women's issues in epilepsy

Overall, the rates of awareness on key issues among the study patients was low.
Although 60% of the WWE were on folic acid supplementation, only 17% had been informed on the need for the folic acid. There was no difference in awareness observed between those who had been in the clinic for a longer duration (>2 years) or shorter duration.
In our survey of residents, 95% understood the role of folic acid, implying that other factors other than knowledge could play a role in limited patient awareness. In a similar questionnaire study by Bell et al, on Information recalled by WWE in the U.K, 38% recalled being given advice on folic acid(16), while the Norwegian study by Kampman et al, looking at guidelines implementation for WWE, 56% recalled receiving this advice from their Neurologists(78).

The awareness on the effects of AEDs on OCP was only in 14.4% of patients, which is lower than rates reported in other studies, ranging from 32-71 % (14, 16, 78, 92).
Contraceptive failures have been reported in this population, in up to nearly 25% of those on OCP (15).Although the overall rate of contraception use was low, at 17%, the most frequent method was the oral contraception followed by hormonal injectables, emphasizing the need for awareness on interaction. It is interesting to note that one of the WWE who was gravid at the time of study reported hormonal contraception failure. Fairgrieve et al, found more than half the pregnancies in WWE were unplanned, including 27 to women who reported contraceptive failure (15).

Previous surveys indicated that doctors were unaware of the interaction between OCPs and Enzyme inducing AEDs(93). In our survey of residents, 92% knew that EIAEDs interact with OCP, and could lead to their reduced effectiveness. This however was not reflected in the patient care in terms of counseling. The proportion who had received preconception counseling was at 10%.Only 30% of the WWE had been sensitized on the need to see the doctor when planning to conceive. When probed further, this revolved around prescription review, but few had awareness

on actual aspects of the preconception counseling. Perhaps the lack of awareness on guidelines recommendation or increasing time constraints on the out-patient clinic may explain the limited counseling.

Previously published studies have found preconception counselling rates ranging from 6-77% (9,13,75).The higher rates in Norwegian study (77%) could be explained in part by their active dissemination and implementation of guidelines(78).

Practice guidelines for the management of WWE advocate for preconception counseling, and there is evidence to suggest that preconception planning and effective AED management can reduce the risks of adverse pregnancy outcomes(38). Evidence also suggests that a large number of WWE considering children would like additional information about pregnancy and child birth issues well before pregnancy (6, 14).

Risks associated with inadequate counseling of WWE regarding reproductive aspects are significant. A German questionnaire study of WWE found that 18% of the WWE stopped or reduced AED during pregnancy without consulting their doctor, risking potential consequences of poorly controlled seizures for both mother and baby(94). Around 40% of the WWE who consciously abstained from having children in this study reported 'risk of malformation caused by AEDs' among their reasons, despite the vast majority of WWE giving birth normal babies(95). Further potentially preventable consequences of inadequate counseling include increased risk of congenital malformations and poor seizure control due to the metabolic impact of pregnancy on AED(89).

Our study population was a relatively young one, with 75% being less than 35 years. This reflects the peak reproductive age, hence it is prudent to think ahead and discuss issues of pregnancy so that the patients are primed for when the time comes.

More than 90% of our study participants had not received advice on AED effects on bone health, similar to the findings reported in the Norwegian study(78).In the survey of residents, 80% were aware that long term use of certain AEDs is associated with decreased bone mass (osteoporosis). This however, was not reflected on the patient's awareness.

Performance measure

The performance measure for counseling of WWE by our health care givers was at 21%, as assessed by patients' response. This is lower than other studies ranging 33-36% (90, 96-98) .The discrepancy may be explained by the lack of proper records to verify actual counseling rates.

Quality performance measures have become increasingly important in standardization of the delivery of quality care. The AAN measures aim at improving epilepsy care following implementation in daily practice.

Quality improvement requires adoption of the quality measures and consistent implementation. Identifying the performance level in this study serves as a platform towards looking for the gaps towards optimum care.
The data gathered sets a basis for further studies with focus on barriers to limited patient awareness, and barriers to discrepancies between the outlined process of care and the outcome variable. It also serves as a step towards developing approaches to reinforce adoption of the measures

Knowledge of residents

There is some research to suggest that limited patient awareness and knowledge may reflect inadequate health-care giver knowledge on aspects of care of WWE (79, 93). This argument is supported by the fact that WWE are more likely to initiate conversations on pregnancy and birth control than their health-care professionals.

The main finding in this section was that the residents were knowledgeable in most aspects of care of WWE. These included (anti- epileptic drug &OCP interaction at 92.5%, Folic acid & teratogenicity at 95%, and effects of antiepileptic drugs on bone health 80%).

However this was not reflected in the patient care, as far as patient awareness is concerned. Perhaps other reasons other than health-care giver knowledge may play a role in limited patient awareness.

Most of our findings were similar to previous KOWIE-II questionnaire studies (79-81). Difference was observed in the following areas: Only 39% of the residents knew that the AED

most appropriate in pregnancy was one that was most suited for the seizure type, compared to 75% in the study done on the US physicians(79). This might be explained by the fact that prescriptions locally are mostly driven by the cost and availability of the drug as opposed to seizure type .The response to this question was similar to the study done in Nigeria by Kelechi et al (81), at 40% which perhaps reflects choices of AEDs in resource limited area. Sexual dysfunction in WWE was known to 62.5% of our residents. Previous studies done have found this to be at less than 40% (4, 79, 80).

Plausible explanations for low awareness levels

It is evident that WWE have limited awareness about issues on contraception and pregnancy from our study .What is less clear are the barriers to WWE receiving and retaining information.

From our survey on the knowledge of residents on issues of WWE, the residents' knowledge was comparatively good on pregnancy related issues. It is plausible that other factors other than health-care knowledge may contribute to the low level of awareness amongst the patients.

Perhaps the health-care givers are not aware of the guideline recommendations on the need for active counseling for WWE of reproductive age. Our local guidelines were only published last year, and are yet to be accessible to all practitioners. In the study by Kampman et al (78), active implementation of the guideline recommendation in a condensed format resulted in an increase on the rate of preconception counselling and information delivery to WWE.

WWE may not always recall information provided to them by the health-care professionals. In the study by Fairgrieve et al, a review of case-notes of 25 women who denied having received preconception advice showed that 32% had been counseled (15).
Patients with epilepsy, especially Temporal Lobe Epilepsy are at increased risk of cognitive deficits, including memory and attention (99, 100).This could impact upon uptake and retention of information, suggesting the need for information consolidation over repeated medical appointments.

The finding from a previous study done locally by Mugaya et al (101)that 13.7% of our patients with epilepsy seek alternative therapies may increase the likelihood of receiving conflicting advice or diluting the evidence-based information provided by the health care practitioner. Thus,

there is a possibility that information may have been given, but because of alternative therapies, may have been watered down or not registered at all.

The operational structure of the clinic may also contribute to the limited information .All neurological cases (including strokes and other neurological cases) are seen/reviewed on the same day, therefore limiting the patient-doctor time. This may translate to prescription renewal and seizure control as the main focus of care. Increasing time constraints on an outpatient clinic, may be a barrier to high quality care for patients with chronic neurological conditions

8.0 CONCLUSION

In conclusion, from our study:

The prescription practices are in relative conformity to guidelines recommendation (Majority of the patients are on monotherapy at 61% and folic acid at 60%).

Certain aspects of the prescription patterns (polypharmacy) are not pharmacologically sound and not in keeping with the guideline recommendations.

Most patients are receiving limited information on key aspects of their care.

The residents are knowledgeable in most aspects of women related issues in epilepsy, but this is not reflected in the patient awareness levels.

9.0 STUDY LIMITATION

Our study was conducted in a hospital set-up. The results cannot also be generalized for the epilepsy specialized clinics/centers.

Recall bias among the patients could have affected the information recalled on key issues. Patients with epilepsy are at increased risk of cognitive dysfunction including memory loss

Due to limitations in the record keeping system, we did not set out to verify the information given by the patients by going through the case notes/patients files. We cannot rule out the possibility of a discrepancy in the information given by patients.

10. RECOMMENDATIONS

From the findings in our study, we recommend a condensed guideline (package) specific for W.W.E, to aid in the gaps in care.

We also recommend continuous medical education to guide to best practice with regards to AED prescriptions and rationalizing polypharmacy.

Further studies are needed to assess factors contributing to limited awareness among patients

Further studies may need to be done to identify barriers to limited patient awareness, and factors influencing prescription practices and address such issues through national policies. This may require a review of the operational structure of the clinic, with regards to patient-doctor time, patient numbers and resident (doctor) numbers.

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12.0 APPENDICES

APPENDIX 1- PATIENT CONSENT EXPLANATION FORM

Introduction

I am Dr. Beryl Achieng Otieno, from the University of Nairobi. I am currently doing my postgraduate studies in Internal Medicine. As part of my postgraduate studies, I am required to do a research project. I am undertaking a study on the Quality of Care of Women with Epilepsy of reproductive age, at the Kenyatta National Hospital.

Purpose of the study

The aim of the study is to assess the level of care offered to Women with Epilepsy, of reproductive age in terms of medication and the information given to them by the care givers.

Procedures involved

This survey will take approximately 20-30 minutes. The study will include reviewing your prescriptions and answering to a study proforma. Information to collect includes your demographic data, current medications, contraceptive use and your awareness of issues of Women with Epilepsy.

Your rights as a participant in this study

Your participation in this study is voluntary.

Whether you choose to participate or not will not affect your medical care. You are free to terminate the interview and withdraw from the study at any time. You are free to ask questions before signing the consent form and during the study. Confidentiality will be maintained at all times

Risks of participation

There are no risks that you will experience.

Benefits of participation

At the end of the study, I will hand over the findings to the Internal Medicine department of UoN. Any useful information that will improve the quality of care will be shared with the caregivers for appropriate action.

Confidentiality

All information gathered during the study will be kept confidential. Only researchers have access to personal information which. Information gathered will be documented and analyzed anonymously.

If you have any question during the course of the study, you may contact the following:

1. DR. BERYL ACHIENG OTIENO, UNIVERSITY OF NAIROBI,
   DEPARTMENT OF CLINICAL MEDICINE AND THERAPUTICS,
   Mobile: 0722-984722. ***OR***

2. CHAIRPERSON, KNH/UON ETHICAL REVIEW COMMITTEE,
   TEL: 020-2726300/0722829500/0733606400/EXT 44102. P.O. Box 20723, Nairobi.

Before I involve you in my study, I kindly ask you to sign the attached consent form below. This consent form will not be linked to your answers.

APPENDIX 2: CONSENT /ASSENT FORM-PATIENTS

STUDY NO……..DATE……TIME……

I hereby give my written and informed consent to allow myself or my…… participate in this study on Quality of Care of women with epilepsy, of reproductive age at Kenyatta national hospital.

I have been adequately explained to about the study by Dr. Beryl Achieng Otieno/her assistant. I do this with the full understanding of the purpose of the study and procedures involved which include review of my prescriptions and answering to a proforma which have been explained to me. I understand that my rights will be respected, and confidentiality maintained at all times.

I also understand that the consent is voluntary, and I am at liberty to withdraw from the study without my care being affected.

Patient's signature……..

Patient's Name……

INVESTIGATOR'S STATEMENT:

I, the Principal Investigator, have fully educated the research participant on the purpose and implication of this study.

Signed…… Date……..

For any further clarification, you may contact

Dr. Beryl Achieng Otieno, at Tel No: 0722-984722.

Or: KNH/ERC (Kenyatta National Hospital/Ethics & Review Committee)

TEL: 020-2726300/0722829500/0733606400/EXT 44102. P.O. Box 20723, Nairobi

13.0 KIAMBATISHO

KIAMBATISHO 1- FOMU INAYOELEZA IDHINI

UTANGULIZI

Mimi ni Dkt. Beryl Achieng Otieno, kutoka Chuo Kikuu cha Nairobi. Kwa sasa nasomea uzamili katika Tiba ya Ndani. Kama sehemu ya masomo yangu ya uzamifu, nahitajika kufanya mradi wa utafiti. Ninafanya uchunguzi kuhusu Ubora wa Malezi ya Wanawake wanaougua Kifafa walio katika umri wa Kuzaa, katika Hospitali Kuu ya Kenyatta.

Lengo kuu yautafiti

Lengo la utafiti huu ni kukadiria kiwango cha malezi inayotolewa kwa wanawake walio na kifafa, wenye umri wa kuzaa hususan matumizi ya dawa na habari ambazo wanapewa na walezi.

Taratibu zitakazohusishwa

Upimio huu utachukua takribani dakika 20-30. Utafiti huu utahusisha kuangalia maagizo ya daktari na kujibu maswali katika fomu. Habari zitakazokusanywa zitahusu data kuhusu hali yako, dawa ambazo unatumia kwa sasa, matumizi ya njia ya kupanga uzazi na ufahamu wa maswala ya Wanawake walio na kifafa.

Haki yako kama mshiriki katika utafiti huu

Ushiriki wako katika utafiti huu ni wa kujitolea. Hata ukichagua kushiriki au ukatae kushiriki haitaathiri matibabu yako. Una uhuru wa kujiondoa katika mahojiano na katika utafiti huu wakati wowote. Una uhuru wa kuuliza maswali kabla ya kutia sahihi katika fomu ya idhini na wakati wa utafiti. Maswala yote yatahifadhiwa kwa siri wakati wote.

Hasara za ushiriki

Hakuna hasara yoyote utakayopitia au kupata.

Manufaa ya kushiriki

Mwishoni mwa utafiti huu, nitawasilisha matokeo ya utafiti katika idara ya Tiba ya Ndani katika Chuo Kikuu cha Nairobi. Habari zozote muhimu zitakazotokana na utafiti na ambazo zitafanya malezi kuwa bora, walezi watafahamishwa ili hatua mwafaka ichukuliwe.

Siri

Habari zote zitakazokusanywa wakati wa utafiti zitahifadhiwa kwa siri. Ni watafiti pekee ndio wanaoweza kufikia habari za kibinafsi. Habari zitakazokusanywa zitaandikwa na kuainishwa bila kutaja washiriki.

Ikiwa una swali lolote wakati wa utafiti, unaweza kuwasiliana na wafuatao:

1. DKT. BERYL ACHIENG OTIENO, CHUO KIKUU CHA NAIROBI,

   IDARA YA MAFUNDISHO YA UDAKTARI NA MATIBABU YA MAGONJWA,
   Simu ya mkono: 0722-984722. ***AU***

2. MWENYEKITI, KNH/UON KAMATI INAYOSHUGHULIKIA MAADILI,
   Nambari ya simu: 020-2726300/0722829500/0733606400/EXT 44102. P.O. Box 20723, Nairobi.

Kabla sijakuhusisha katika utafiti wangu, Naomba utie sahihi katika fomu ya idhini iliyopo hapo chini. Fomu hii ya idhini haitahusishwa na majibu yako.

KIAMBATISHO 2: FOMU YA IDHINI /KUBALI- WAGONJWA

NAMBARI YA UCHUNGUZI……TAREHE……WAKATI……

Natoa idhini andishi na ninayoifahamu ili kuniruhusu au ……wangu kushiriki katika utafiti huu kuhusu Ubora wa Malezi ya Wanawake walio na Kifafa, wenye umri wa kuzaa katika Hospitali Kuu ya Kenyatta.

Nimepewa maelezo yanayofaa kuhusu utafiti wa Dkt. Beryl Achieng Otieno/msaidizi wake. Ninafanya hivi kwa vile naelewa lengo kuu la utafiti huu na taratibu zitakazohusishwa kama vile kuangaliwa kwa maagizo ya daktari na kujibu maswali katika fomu ambayo nimepewa maelezo yake.

Ninaelewa kuwa haki zangu zitaheshimiwa, na suala la kuhifadhi utambuzi wangu utadumishwa wakati wote.

Pia ninaelewa kuwa idhini ya kushiriki ni ya kujitolea, na nina uhuru wa kujiondoa katika utafiti huu bila malezi yangu kuathiriwa.

Sahihi ya Mgonjwa……..

Jina la Mgonjwa……

KAULI YA MCHUNGUZI:

Mimi, Mchunguzi Mkuu, nimemuelimisha mshiriki wa utafiti kuhusu lengo kuu la utafiti na kinachodokezwa na utafiti huu.

Sihihi…… Tarehe……..

Kwa maelezo zaidi, unaweza kuwasiliana na

Dkt. Beryl Achieng Otieno, katika nambari ya simu: 0722-984722.

Au: KNH/ERC (Kenyatta National Hospital/Ethics & Review Committee)

Nambari ya simu: 020-2726300/0722829500/0733606400/EXT 4

APPENDIX 3: STUDY PROFORMA

SECTION A

General Information:

Study Number		Date	
Patient Number		Contact (Tel No)	
Date of Birth		Age in years	

SOCIAL-DEMOGRAPHIC DATA(Tick where appropriate)

Marital Status

(1) Never Married ☐ (2) Married ☐ (3) Separated ☐

(4) Divorced ☐ (5) Widowed ☐

Level of Education.

(1) No formal education ☐

(2) Primary a) Lower ☐ b) Upper ☐

(3) Secondary ☐

(4) College/University ☐

Occupation Status

1) Unemployed ☐
2) Formally employed ☐
3) Informal sector...e.g. Jua Kali,hawker ☐
4) Self –employed ☐
5) Student ☐

Reproductive history ☐

1) Parity

2) L.M.P

3) Contraception use

HISTORY OF EPILEPSY

1) Age of first seizure

2) Disease duration(in years)

3) Type of epilepsy (from file)

1) Generalized tonic clonic

2) Simple Partial

3) Complex Partial

4) Others

4) Number of seizures in the last

One month

Three months

Six months

One year

CURRENT MEDICATIONS. (Obtain Information from Prescription)

Are you on AED's 1) Yes

2) No

If yes, are you on 1) Monotherapy

2) Polytherapy

If yes, and on monotherapy, which drugs are you on, and the dosage?

Drug	**Dosage**	**Duration of use**
Carbamazepine		
Phenobarbitone		
Sodium Valproate		
Phenytoin		
Clonazepam		
Lamotrigine		
Levetiracetam		
Others(specify)		

If yes, and on Polytherapy, which combinations are you on, and dosage?

Drug combination	Dosage			Duration of use
Carbamazepine/Phenytoin				
Carbamazepine/Phenobarbitone				
Carbamazepine/Valproate				
Valproate/Phenobarbitone				
Carbamazepine/Phenytoin/Phenobarbital				
Carbamazepine/Valproate/Phenobarbital				
Others(Specify)				

Are you on folic acid Yes ☐

No ☐

PATIENT AWARENESS SECTION

How long have you attended the KNH Neurology clinic?

Less than one year	☐
One year	☐
Two years	☐
More than two years	☐

Have you been informed on	No	Yes, from clinic	Yes, from elsewhere
Need for folic acid supplementation during pregnancy			
Effects of AEDs on Oral Contraception			
Need to contact a doctor when planning pregnancy/when pregnant			
Have you received any preconception /pregnancy advice			
Effects of AEDs on bone health			

Where did you get the information that you have obtained "elsewhere"? (more than one answer possible)

Internet	☐
Pharmacy	☐
Family or friends	☐
Epilepsy society	☐
Other(Magazines, radio, television)	☐

Do you require contraception? Yes ☐ No ☐

In case you do, what type of contraception have you used during the past year?

Oral contraceptive,	☐	brand name
Condom	☐	
Depo-Provera(Injectables)	☐	
Intrauterine contraceptive device	☐	
Other		

KIAMBATISHO 3: FOMU YA UCHUNGUZI

SEHEMU A

Habari za Jumla:

Nambari ya Uchunguzi ☐ Tarehe ☐

Nambari ya Mgonjwa ☐ Nambari ya Simu ☐

Tarehe ya kuzaliwa ☐ Umri (miaka) ☐

DATA YA KIDEMOGRAFIA YA KIJAMII (Weka alama √ panapostahili)

Hali ya Ndoa

(1) Hajaolewa kamwe ☐ (2) Ameolewa ☐ (3) Wametengana ☐

(4) Wametalakiana ☐ (5) Mjane ☐

Kiwango cha Elimu.

(1) Hana elimu rasmi ☐

(2) Elimu ya Msingi a) Madarasa ya Chini ☐ b) Madarasa ya Juu ☐

(3) Elimu ya Sekondari ☐

(4) Chuo/Chuo Kikuu ☐

Hali kikazi/taaluma

6) Hana kazi ☐

7) Kazi ya kuajiriwa ☐

8) Sekta isiyo rasmi...e.g. Jua Kali, mchuuzi ☐

9) Ajira ya kibinafsi ☐

10) Mwanafunzi ☐

Historia ya uzazi ☐

4) Usawa

5) L.M.P

6) Matumizi ya vizuia uzazi

HISTORIA YA KIFAFA

4) Umri aliopata maradhi

5) Muda aliokaa na maradhi (miaka)

6) Aina ya Kifafa(kutoka faili)

1) Generalized tonic clonic

2) Simple Partial

3) Complex Partial

4) Nyingine

4) Idadi ya kuanguka na kupoteza fahamu kwa

Mwezi mmoja

Miezi mitatu

Miezi sita

Mwaka mmoja

MATIBABU YA SASA. (Pata habari kutoka kwa agizo la daktari)

Je, unatumia dawa za AED's 1) Ndio

2) La

Ikiwa ndio, unatumia 1) Tiba sahili

2) Tiba mseto

Ikiwa ndio kwa tiba sahili, unatumia dawa zipi, na kiwango gani?

Dawa	**Kipimo**	**Muda wa matumizi**
Carbamazepine		
Phenobarbitone		
Sodium Valproate		
Phenytoin		
Clonazepam		
Lamotrigine		
Levetiracetam		
Nyingine (taja)		

Ikiwa ndio kwa tiba mseto, unatumia mchanganyiko gani, na kiwango gani?

Mchanganyo wa dawa	Kiwango			Muda wa matumizi
Carbamazepine/Phenytoin				
Carbamazepine/Phenobarbitone				
Carbamazepine/Valproate				
Valproate/Phenobarbitone				
Carbamazepine/Phenytoin/Phenorbabitone				
Carbamazepine/Valproate/Phenorbabitone				
Nyingine (Taja)				

Je, unatumia folic acid Ndio ☐

La ☐

SEHEMU YA KUTATHMINI UFAHAM U WA MGONJWA

Umehudhuria kiliniki ya nyurolojia ya KNH kwa muda gani?

Chini ya mwaka mmoja ☐

Mwaka mmoja ☐

Miaka miwili ☐

Zaidi ya miaka miwili ☐

Umepewa habari kuhusu	la	Ndio, kutoka kiliniki	Ndio, kutoka kwingine
Haja ya kuongezwa folic acid wakati wa ujauzito			
Athari ya dawa za AEDs juu ya uzazi vya kumezwa			
Haja ya kumwona daktari wakati unapopanga kupata mtoto/ukiwa mjamzito			
Umepata ushauri wowote kuhusu ujauzito(kabla kutunga mimba)/wakati wa ujauzito			
Athari ya dawa za AEDs kwa afya ya mfupa			

Ulipata wapi habari ulizopata "kwingineko"? (ikiwezekana toa jibu zaidi ya moja)

Mtandao ☐

Duka la dawa ☐

Familia au marafiki ☐

Shirika la wagonjwa wa Kifafa ☐

Nyingine (Magazeti, redio, televisheni) ☐

Je, unahitaji huduma za kuzuia uzazi? NdioLa ☐ ☐

Ikiwa unahitaji, ni njia gani ya kuzuia uzazi ambayo umetumia katika mwaka uliopita?

Vizuia vya kumezwa, ☐ Jina/chapa

Kondomu ☐

Depo-Provera(sindano) ☐

Vinavyowekwa kwenye mfuko wa uzazi ☐

Nyingine

APPENDIX 4-CONSENT EXPLANATION FORM-RESIDENTS

Dear Doctor, I would like to ask for your participation in this survey, as part of the study on "Quality of Care of Women with Epilepsy of reproductive age, and Knowledge of resident doctors' on issues of women with epilepsy at Kenyatta National Hospital."You are requested to answer to the study questionnaire is as truthfully as possible.

TITLE OF THE STUDY:

Quality of Care of Women with Epilepsy of reproductive age, and Knowledge of resident doctors' on issues of women with epilepsyat Kenyatta National Hospital

PURPOSE OF THE SURVEY:

This part of the study aims to assess the knowledge of residents on issues of Women with Epilepsy.

RISK OF THE STUDY:

There is no risk in participating in the study.

POSSIBLE BENEFITS:

By participating in the study, you will aid in generating an understanding of the current level of care offered to Women with Epilepsy of reproductive age. The study aims to promote better practice on the care of Women with Epilepsy.

COMPENSATION:

There will be no compensation given.

RIGHT TO WITHDRAW

Your participation in this study is voluntary. You are free to decline it, without any consequences. Youalso have the right to change your mind anytime without any consequences.

CONFIDENTIALITY:

Your identity will remain absolutely confidential .The answers obtained will be documented and analyzed anonymously. Only researchers will have access to personal information which only includes your age, gender, specialty and year of study. The researchers aim for this study this is for pure academic and scientific purposes.If you have any questions about the study, contact: Dr.Beryl Otieno on 0722-984722.

Before I involve you in my study, I kindly ask you to sign the consent form below.

You are free to ask any questions before signing the consent form.

APPENDIX 5-CONSENT FORM-RESIDENTS

STUDY NO……..DATE……TIME……

I (Dr's name)……hereby give my consent to participate in this study on Quality of Care of women with epilepsy, of reproductive age at Kenyatta national hospital.

I have been adequately explained to about the study by Dr. Beryl Achieng Otieno.

I do this with the full understanding of the purpose of the study and procedures involved which is answering to a questionnaire which has been explained to me.

I understand that my rights will be respected, and confidentiality maintained at all times.

I also understand that the consent is voluntary, and I am at liberty to withdraw from the study without any consequences.

By signing this consent form, I certify that all information I have been given is true and correct to the best of my knowledge.

_____ Printed Name and Signature of Subject

_____ Printed Name and Signature of Investigator.

For any further clarification, you may contact

Dr. Beryl Achieng Otieno, at Tel No: 0722-984722.

Or: KNH/ERC (Kenyatta National Hospital/Ethics & Review Committee)

TEL: 020-2726300/0722829500/0733606400/EXT 44102. P.O. Box 20723, Nairobi

APPENDIX 6: Knowledge of Women's Issues and Epilepsy (KOWIE II) Questionnaire

Study number ☐

Year of Graduation from Med school ☐

Residency area ☐ Clin. Medicine ☐ Obs/Gyne

Year of starting residency ☐

Circle the most appropriate response

True(T), **False**(F),**Don't Know**(D)

1. During the menstrual cycle, endogenous estrogen has been found to be a proconvulsant, while progesterone has anticonvulsant properties	T F D
2. Women with epilepsy have a higher incidence of sexual dysfunction Compared to women without epilepsy.	T F D
3. Enzyme inducing AEDs may reduce the effectiveness of Various contraceptives.	T F D
4. Some AEDs are associated with osteomalacia (reduced bone mass).	T F D
5. The best AED during pregnancy is one that is most appropriate for the patient`s seizure type and/ or syndrome."	T F D
6. Women with epilepsy should stop taking their AEDs when they become pregnant.	T F D
7. Taking folic acid before and during pregnancy may reduce teratogenesis In children born to women with epilepsy taking AEDs	T F D
8. Vitamin K may reduce the risk of newborn hemorrhagic disorder Associated with AEDs	T F D
9. The majority of women with epilepsy have healthy children.	T F D
10. Most women taking AEDs can safely breast feed.	T F D