Socio-Demographic Predictors of Healthcare Quality for Epilepsy Patients in Selected Hospitals in Nairobi, Kiambu, and Machakos, Kenya

Tiberry D.O. Nyakwana*, Simon Karanja, and John Gachohi

- *School of Public Health, College of Health Sciences, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya.*

***Corresponding author**: Tiberry D.O. Nyakwana. Email address:

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Abstract

BACKGROUND

Epilepsy is a neurologic condition that accounts for 1% of the global disease burden. If diagnosed and treated early, 70% of the cases can achieve seizure remission. Mass sensitization around the Nairobi metropolis since 2010 has increased the number of patients seeking treatment in local facilities. Nevertheless, those on treatment still suffer epilepsy-led injuries. There is a paucity of data on quality of care, and studies have not documented its socio-demographic predictors. This study aimed to determine predictors of quality of care for clients at the selected hospitals in the Nairobi metropolis and its environs (Kiambu and Machakos counties).

METHODOLOGY

This was a cross-sectional study conducted between May and September 2021 in selected level-five hospitals in three counties in Kenya, namely Nairobi, Kiambu and Machakos. Quantitative data were collected from 373 sampled epilepsy patients using semi-structured questionnaires. Data were analyzed using chi-square, logistic and multiple linear regression analyses. The statistical significance of the relationship between the variables was tested using χ^2 with a level of significance fixed at 0.05.

RESULTS

Quality of care ratings varied by age, with the 0–5 age group rating care highest, and the 19–28 and 50+ age groups rating it lower. Gender did not significantly influence care ratings, while occupation was significantly associated with higher ratings (χ^2=22, df=2, P=0.000).

CONCLUSION AND RECOMMENDATIONS

Different views on care quality suggest that a single approach may not work well for all epilepsy patients. Occupation was identified as the primary sociodemographic predictor in how people rated the quality of their healthcare. Training healthcare staff to consistently show courtesy and respect to all epilepsy patients is essential. Further longitudinal studies are required to monitor fluctuations across different age groups

Keywords: *Predictors, Quality of Healthcare, People Living with Epilepsy*

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Introduction

Epilepsy is one of the most common neurological disorders affecting about 70 million people worldwide (1). It accounts for 1% of the global disease burden with 90% of those affected reside in Middle to Low-Income countries (2,3). There are about 10 million people living with epilepsy in Sub-Saharan Africa only and one million in Kenya (4). It has a high social and economic burden with an average annual cost estimate of €1528 for lost production and disability-adjusted life years (DALYs) for hospital admissions, care, and indirect costs such as loss of productivity in Europe (5). In Africa, there is generally a higher prevalence of Epilepsy resulting in disability, death and economic loss. The losses are attributed to the cost of medical

care, a strain on the health systems and loss of productivity. These high prevalences range from nine to 37 per 100,000 population and are linked to the high prevalence of possible neurological etiologies such as malaria and neurocysticercosis (6).

The high morbidity rates of epilepsy especially in rural areas in Kenya mirror other developing countries and it remains a major concern of public health. The higher rates in rural Kenya are attributed to reasons such as limited healthcare access, low levels of awareness and stigma associated with epilepsy. In such areas, there is a glaring treatment gap with less than 30% of the people living with epilepsy receiving adequate care (7). Despite the poor health outcomes and severe consequences of untreated epilepsy, this condition has historically inadequate public health attention Epilepsy is often associated with cultural beliefs and superstitions (8). Additionally, the limited infrastructure and insufficient antenatal care exacerbate the increased risk of developing epilepsy through birth injuries (9).

Healthcare quality is defined as the application of medical science and technology to maximise care benefits while reducing the risks (10), the main aspects of care quality are efficiency, effectiveness, accessibility, evidence-based care, timeliness and limited time wastage (11). The structures, treatment processes and treatment outcomes are pivotal areas measured to gauge the performance of healthcare quality (12). Consequently, when all these are considered, there are significant gaps in the treatment of epilepsy in Kenya and Africa at large. According to the WHO, despite the huge epilepsy burden of 5-20 per 1000 population, treatment remains scarce with nearly 70% of people living with epilepsy hardly receiving adequate care due to factors such as the lack of resources, insufficient infrastructure and the stigma associated with epilepsy (13,14).

For instance, a recent study highlighted the healthcare system's struggles to adequately address the needs of people living with Epilepsy in that, only a small fraction (a third) of epileptic patients in western Kenya received proper treatment due to financial constraints and inadequate healthcare infrastructure (15). The wide treatment gap is further exacerbated by the shortage of trained healthcare professionals hampering effective diagnosis and treatment. In urban areas such as Nairobi, Patients attending a neurology clinic reported challenges related to medicine adherence due to the high cost of anti-epileptic drugs and the perception that the condition is associated with curses or witchcraft. The cultural associations of epilepsy are very evident with a significant proportion of the patients opting for alternative therapies such as herbal remedies and prayers, bringing into focus the lack of trust in conventional therapies. Moreover, the stigma associated with epilepsy remains a significant barrier to care resulting in a lower quality of care for people living with epilepsy. It is important to also note that poor understanding of epilepsy by the public and healthcare providers contributes to worse outcomes for the people living with epilepsy (15).

The Kenya Menta Health Policy 2015-2030 was created to address the challenges to epilepsy care through the integration of mental health and neurological health services into primary care. This integration is aimed at improving diagnosis, treatment and follow-up care for neurological conditions such as epilepsy. Additionally, public health campaigns to raise awareness and the introduction of antiepileptic drugs (AEDs) complement the Ministry of Health efforts (7). The “Shine Epilepsy Support” project is a notable NGO-led initiative at the forefront of educating the public about epilepsy to reduce epilepsy-associated stigma as well as working to enhance epilepsy treatment. Complementary to the government and NGOs, epilepsy clinics affiliated with the Kenya Association for the

Welfare of People with Epilepsy **(KAWE)**provide critical services for epilepsy care such as diagnosis, treatment and improved access to medication.

The challenges faced by Kenya in delivering quality epilepsy care are many, there is a lack of adequate staffing, resources, and supplies in healthcare facilities. Additionally, information, transportation barriers and effective communication are not optimal for ensuring the delivery of quality epilepsy care (16). There is a paucity of data assessing the quality of care with a focus on the available infrastructure, and the provision of equitable epilepsy care, we therefore aimed to determine predictors of quality of care for patients at the selected hospitals in the Nairobi metropolis and its environs.

Materials and Methods

Study design and study sites

This cross-sectional study was conducted between May and September. This study was conducted in five selected level five hospitals 2021 in selected level five hospitals in the three counties of Nairobi, Kiambu and Machakos. They were chosen because, being level 5 facilities, they had Epilepsy clinics. These were Mama Lucy Level 5 Hospital, Kiambu Level 5 Hospital, Gatundu Level 5 Hospital, Thika Level 5 Hospital and Machakos Lev 5 Hospital based on an ongoing epilepsy community sensitization and mobilization campaigns by the National Epilepsy Coordination Committee (NECC) in Nairobi Metropolis and its environs since 2010. In partnership with the Bank of Africa through the Angaza Kifafa. This programme was later escalated throughout Kenya. It has a positive effect on the number of patients seeking treatment in health facilities.

Sample size determination

The sample size was calculated by the formula used by Fisher *et al*., 1998 based on the assumption that the three counties are one system and that the prevalence of epilepsy varies with the population.

$$n = \frac{Z^2 p(1-p)\ D}{d^2}$$

Where:

Z = standard deviation, 1.96 at a 95% confidence interval

n = is the desired sample size

p = proportion of population estimated to have epilepsy = 0.5

$q = 1 - p\ (1 - 0.5) = 0.5$

d = degree of accuracy = 0.05

Thus, $n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 385$ participants

Inclusion and Exclusion criteria

Participant inclusion considered a confirmed diagnosis of epilepsy (clinical, electrophysiological or radiological) both newly diagnosed or on follow-up, should have accessed healthcare within the last year and willingness to participate in the study. Those patients with non-epileptic seizures or those whose conditions had not been confirmed, and those whose clinical state could not allow data collection were excluded. Study respondents were recruited consecutively until the desired number was reached.

Table 1:
Distribution per study site

Institution	Frequency	Percentage
Gatundu	78	20.9
Kiambu	73	19.6
Thika	79	21.2
Mama Lucy	69	18.5
Machakos	74	19.8
Total	373	100

Data collection

Quantitative data was collected using semi-structured questionnaires. The interviews were conducted under strict COVID-19 public health protocol where social distance was observed and face masks were enforced. Techniques to minimize bias included double data entry of quantitative data into the spreadsheets by two research team members and training of data collectors to administer the standardized questionnaires.

Data management and analysis

Data were coded, double-entered for accuracy, and thoroughly cleaned. SPSS version 26 was used for variable definition, data entry validation, and group filtering. Descriptive statistics displayed the generated data, and the quality of care rating was determined using a median split method, where scores below 47 were classified as low quality and those at 47 or above as high quality. Univariate analysis assessed associations between variables within clusters, while bivariate analysis examined inter-variable influences. Significant variables underwent multivariate logistic regression, and statistical significance was tested using Chi-square (χ^2) at a 0.05 significance level.

Ethical considerations

Ethical approval was obtained from Jomo Kenyatta University of Agriculture and Technology Ethics Committee Approval Number JKU/IERC/02316/0039 and the Board of Post Graduate School. The authority to conduct the study was also obtained from the National Commission for Science, Technology and Innovation (NACOSTI) Ref No: 691998. All participants were informed about the study and requested to consent to participate in the study through written informed consent. For the minors, parental consent was required. Confidentiality of the participants was maintained and the information obtained was used for the sole purposes of the study.

Results

Socio-demographic characteristics

A total of 373 participants were recruited, completed the questionnaires and were included in the analysis.

Table 2:
Socio-Demographic Characteristics of the Study Respondents

Characteristics	Categories	Frequency	Percentage
Age	*6-12*	13	3.5
	13-18	58	15.5
	19-28	132	35.4
	29-49	140	37.5
	50+	20	5.4
Sex	*Male*	191	51.2
	Female	182	48.8
Occupation	*Formal Employment*	76	20.4
	Informal Employment	225	60.3
	Not Employed	72	19.3
Religion	*Christian*	288	77.2
	Muslim	75	20.1
	Hindu	10	2.7
Education	*No formal Education*	20	5.4
	Primary	180	48.3
	Secondary	114	30.6
	Tertiary	59	15.8
Marital Status	*Single*	104	27.9
	Married	224	60
	Under age	45	12.1

The mean age of participants was 29.51 ± 11.79 years with a range of 2–71 years. The age category composition was as follows; 0-5yrs constituted 2.7% (n=10), 6-12 years were 3.5% (n=13), 13-28 years were 15.5% (n=58), 19-28 years were 35.5% (n=132), 29-49 were 37.5 (n=140) and those aged 50+ comprised of 5.4% (n=10). More than half of the respondents (51.2%) were males, three-quarters (67.6%) were married, and more than half (53.6%) had attained a primary school level of education and below. Most of the participants were Christians (77.2%) and almost half of the respondents were in informal employment. A detailed description of the socio-demographic characteristics of the study participants is shown in Table 2.

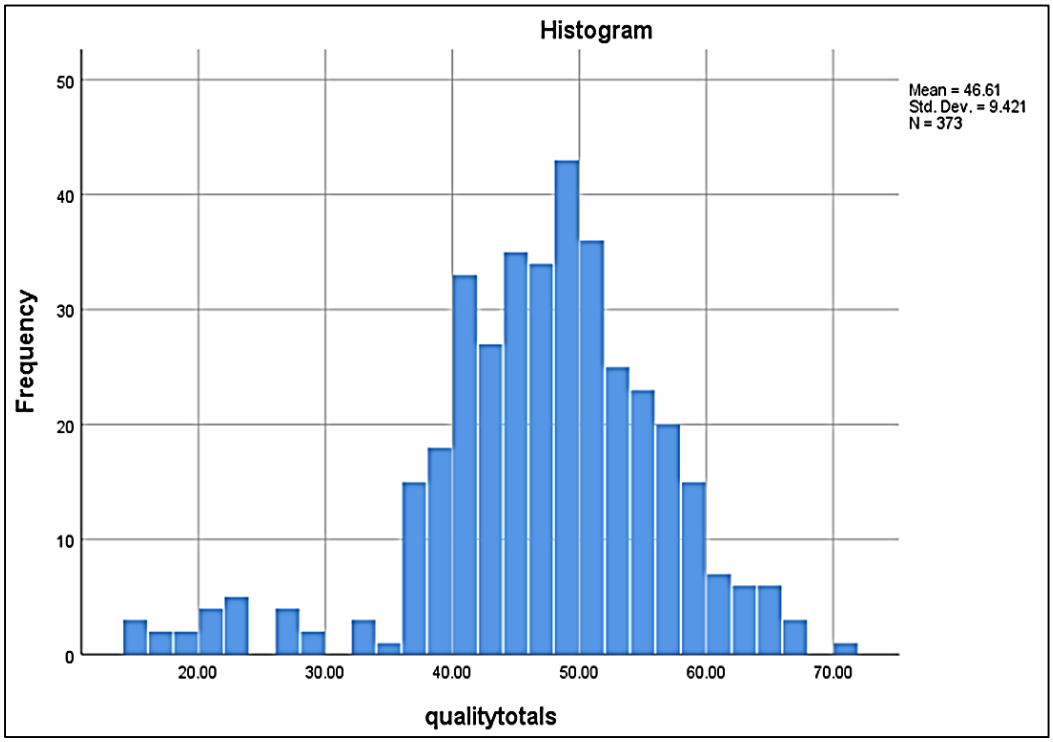

Figure 1:
Quality of Care Ratings

Table 3:
Quality of Care (QoC) Domains

Variable	N	% of QoC Domain Rating	Mean	Factor Weight
Respect	373	15.31	5.98(1.685)	0.239
Communication	373	13.90	5.57(1.373)	0.217
Tolerability of side effects	373	12.30	6.40(1.667)	0.192
Effectiveness	373	12.24	5.32(2.129)	0.191
Affordability	373	10.70	4.86(1.915)	0.167
Counselling on side effects	373	9.61	3.72(1.635)	0.150
Geographical access	373	9.55	3.79(1.782)	0.149
Privacy Ratings	373	9.48	7.02(1.693)	0.148
Promptness Measures	373	6.91	3.95(1.409)	0.108
Overall Quality of care	Low quality High Quality		176 (47.2%) 197(52.8%)	

Quality of care rating

The composite score was a median of 47, a mean of 46.6, a range of 56, a variance of 88, standard deviation of 9.4. Using a median split at 47/90, out of 373 respondents, 52.8% (n=197) rated quality of care as high and 47.2% (n=176) rated it as low. Figure 1.

A factor weight, an aggregate assigned to various performance factors when creating a scenario for bid analysis, was used to designate the comparative load to the different quality domains under study. Based on factor weight, respect had the most positive weight/loading of 0.239 followed by communication (0.217), tolerability (0.192), effectiveness (0.191), affordability (0.167), counselling (0.150), geographical access (0.149), privacy (0.148) and promptness (0.108). Table 3.

Bivariate analysis of socio-demographics and quality-of-care ratings

The analysis shows that age and sex had no significant association with the patient's quality of care rating (P >0.05), with most age groups rating care as high except for the 19-28 and 50+ groups who rated the quality lower. Similarly, gender differences were minimal, with roughly equal proportions of males (52.9%) and females (52.7%) rating care as high quality. Among the demographic factors, occupation emerged as a significant predictor of quality-of-care ratings, while other demographics did not show a notable impact (p > 0.05. (Table 4).

Table 4:

Association between socio-demographic characteristics of the study population and the quality-of-care rating

Variables	Categories	N (%)	High quality		Low quality		χ^2	p-value	Df
			n (%)	CI	n (%)	CI			
Age group	*0-5*	10(2.7)	7(70)	38.4-90.0	3(30)	10.0-61.5	9.005		
	6-12	13(3.5)	9(69.2)	40.0-91.7	4(30.8)	8.3-60.0			
	13-18	58(15.5)	32(55.2)	41.8-67.5	26(44.8)	32.50-58.2			
	19-28	132(35.4)	61(46.2)	37.0-54.0	71(53.8)	46.1-63.0			
	29-49	140(37.5)	81(57.9)	49.6-65.9	59(42.1)	34.1-50.4		0.109	5
	50+	20(5.4)	7(35.0)	13.3-56.3	13(65.0)	43.8-86.7			
Sex	*Male*	191(51.2)	101(52.9)	45.7-59.9	90(47.1)	40.1-54.3	0.001	0.980	1
	Female	182(48.8)	96(52.7)	45.0-59.7	86(47.3)	40.3-55.1			
Occupation	*Formal*	76(20.4)	57(75.0)	31.6-66.7	19(25.0)	33.3-68.4	19.127	0.000	2
	Informal	225(60.3)	108(48.0)	47.8-74.0	117(52.0)	26.0-52.2			
	None	72(19.3)	32(44.4)	52.2-77.2	40(55.6)	22.8-47.8			
Religion	*Christian*	288(77.2)	151(52.4)	46.3-58.5	137(47.6)	41.5-53.7	0.152	0.927	2
	Muslim	75(20.1)	41(54.7)	43.3-66.7	34(45.3)	33.3-56.8			
	Hindus	10(2.7)	5(50.0)	18.2-80.0	5(50.0)	20.0-81.8			
Education	*No formal Education*	20(5.4)	10(50.0)	26.3-71.4	10(50.0)	28.6-73.7	0.777	0.855	3
	Primary	180(48.3)	99(55.0)	47.7-61.8	81(45.0)	38.2-52.5			
	Secondary	114(30.6)	59(51.8)	42.5-61.5	55(48.2)	38.5-57.5			
	Tertiary	59(15.8)	29(49.2)	36.23-62.5	30(50.8)	37.5-63.7			
Marital status	*Single*	104(27.9)	54(51.9)	42.5-62.1	50(48.1)	37.9-57.5	1.061	0.588	2
	Married	224(60.0)	116(51.8)	45.2-58.2	108(48.2)	41.8-54.8			
	Under-age	45(12.1)	27(60)	45.7-74.1	18(40)	25.9-54.8			

Discussion

The findings suggest that clients were generally satisfied albeit the variation of satisfaction across age groups. Most of the respondents were in the 29-49 age bracket with mixed feelings about the quality of care. The 0-5 range were satisfied with the quality of services but the 19-29 and 50+ rate the quality-of-care low indicating that the current practice of one-fit-all may not be optimal across all ages.

Older patients tend to have a higher burden of comorbidity burden which complicates their treatment in terms of balancing the epilepsy medication along with other medication and this ultimately affects their overall satisfaction with epilepsy care (17). Additionally, older patients are likely to have cognitive decline which further complicates their care by affecting the older patients' ability to understand and adhere to medication. Also, the breakdown of communication between the healthcare providers and older patients could ultimately affect the patients' understanding of the complicated healthcare plan leading to feelings of neglect and being misunderstood (18).

The male and female patients had similar feelings about the quality of care and we did not observe a statistical significance indicating that gender did not play a role in influencing perceptions of care quality in this study. This finding is consistent with the idea that the quality of healthcare services provided to individuals with epilepsy is perceived equally across gender lines, suggesting that gender biases in healthcare delivery were minimal or absent in this particular context observed from various regions (19–21). However, epilepsy affects males and females differently specifically on the effects the anti-epileptic drugs have on the reproductive hormones (22). Therefore, the similarity in satisfaction rating may reflect that the current treatment is appropriate for the general needs of males and females.

The relatively high proportion of clients who reported receiving psycho-social support and education about epilepsy reflects an emphasis on holistic care, encompassing not only medical treatment but also empowering patients to actively participate in their healthcare decisions. The communication regarding medication side effects and the complexity of epilepsy treatment further suggests a commitment to patient-centred care, ensuring that clients are well-informed about their treatment options and potential challenges. This finding concurs with WHO& Yip, 2015 who observed that clients and communities served by health care facilities, who receive care that meets their perceived needs, are delivered courteously, on time and effectively relieves their symptoms derive satisfaction that positively impacts their well-being and that of the community at large.

In terms of perceived quality of care, nearly half of the study participants without formal education rated the quality of care as high, while the rest in this group rated the quality of care poorly. Among those who had achieved primary education, slightly more than half of these patients rated the care as high quality while the remaining patients rated the quality of care as low. The patients who had achieved secondary education similarly also had similar feelings about the quality of care and this was split almost halfway with just more than half rating care as high and the remainder in this group rating it as low quality, for those with tertiary education, we observed contrary results with less than half rating the care high and the majority rating the quality of care as high. Education attainment among people living with epilepsy was lower than that attained by the general population and this was in line with observations by Kioni and colleagues who noted that very few children with epilepsy attended regular schools and they had poorer performance in school due to interruption caused by the disease and adverse medicine-side effects (23). Some of the negative effects of

seizure medication on epileptic patients include dizziness, drowsiness and general fatigue which could affect school attendance and ultimately lead to high rates of dropouts. Several findings corroborate this finding such as a study carried out in Australia indicated that people living with epilepsy are less likely to attain (23). This was mirrored in Denmark with the researchers observing that the frequent seizures and AED side effects could impair concentration and memory (24). Similarly, in South Africa, low levels of education attainment were observed particularly in rural areas where misconceptions about the disease contributed to the exclusion or premature withdrawal of children from school (25). The levels of education attended by our study participants did not significantly influence the patient's perception of quality of care as per the chi-square analysis, possibly indicating that regardless of literacy the experiences at healthcare facilities were almost similar.

On religion, the majority of our study participants were Christians, Muslims were less than a quarter at 20.1% (n= 75), while Hindus were a minority. At Mama Lucy Kibaki Level 5 Hospital, more than one-third of the respondents were Muslims. From previous studies, religion significantly impacts the perception of care among epilepsy patients in Asia and Africa as spiritual explanations of the disease are common (26). A study conducted recently indicated that with acknowledgement and respect for the religious and cultural beliefs of patients' healthcare providers reported higher satisfaction with care (27). In as much as religious beliefs play key roles in the experiences of people living with epilepsy in a setting like Kenya, our results indicated a lack of significant association between religion and the quality of care. This notwithstanding, places of worship such as churches, mosques and temples should be catchment ears for campaigns and education about epilepsy.

The quality of care rating among the patients who worked in the informal sector was almost similar and we observed similar findings for the unemployed. In contrast, the majority of the patients working in the formal sector felt that the quality of care they received was of high quality. We speculate that individuals in formal employment are likely to enjoy better care as they have medical insurance and it is easier for them to communicate with health providers as they have a better command of the language due to higher literacy levels. This was reiterated by the significant results we observed in this study. This agrees with Koltai and colleagues (21) who stated that health-seeking behaviour can be directly influenced by AED side effects, marital status, education level and gender and Seneviratne et al (28) who observed that the disruptive nature of epilepsy in social situations strongly interferes with their employability as the attacks are highly unpredictable and do not remain hidden in the social environment. Consequently, PWE suffers higher rates of unemployment and underemployment as they often have greater difficulty keeping their jobs (3). Many employers therefore reject them because they believe they are more susceptible to accidents and absenteeism from work. Those patients who were formally employed were three times more likely to rate the quality of care as high compared to those who were unemployed. This was statistically significant.

Limitations and Strength of the study

This interviewer-dependent study faced potential language barriers, addressed by using translators fluent in local dialects. As a cross-sectional design, it could not establish causality between education level and quality of care, nor capture fluctuations in care quality at different epilepsy treatment stages. Additionally, low patient flow due to the COVID-19 pandemic limited data. Despite these constraints, the study identified key determinants of care quality and

highlighted occupation as a critical predictor, offering insights for improving service standards, guidelines, and workplace support for people with epilepsy.

Conclusion

While the quality of healthcare for the population of interest was generally rated as high due to factors such as courtesy and prompt service, occupation emerged as the strongest predictor of care satisfaction. Other sociodemographic factors including gender, religion and marital status, had little impact on the perceived care quality, with satisfaction levels evenly split. However, the differences in perceptions across age groups warrant further investigation, as the underlying reasons for dissatisfaction among certain age groups remain unclear. Future research should explore these disparities to help improve care for all age demographics.

Recommendations

Investment in healthcare staff training is essential to ensure they consistently treat clients with courtesy and respect. This study serves as a vital resource for researchers, students, and policymakers at all levels. Additionally, longitudinal studies are recommended to track quality-of-care fluctuations across different age demographics.

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Author contact

- Tiberry Nyakwana - nyakwanatiberry@gmail.com
- Prof. Simon Karanja - skaranja@jkuat.ac.ke
- Dr. John Gachohi - mwangigachohi@gmail.com

References

1. WHO. Epilepsy [Internet]. 2019 [cited 2024 Nov 5]. Available from: https://www.who.int/news-room/fact-sheets/detail/epilepsy
2. Kariuki SM, Ngugi AK, Kombe MZ, Kazungu M, Chengo E, Odhiambo R, et al. Prevalence and mortality of epilepsies with convulsive and non-convulsive seizures in Kilifi, Kenya. Seizure [Internet]. 2021 May 14 [cited 2024 Nov 5];89:51. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC7611274/
3. de Souza JL, Faiola AS, Miziara CSMG, de Manreza MLG. The Perceived Social Stigma of People with Epilepsy with regard to the Question of Employability. Neurology Research International [Internet]. 2018 [cited 2024 Nov 5];2018:1–5. Available from: https://www.hindawi.com/journals/nri/2018/4140508/
4. Nicholas A. Unlocking the hidden burden of epilepsy in Africa: Understanding the challenges and harnessing opportunities for improved care. Health Science Reports [Internet]. 2023 Apr [cited 2024 Nov 5];6(4):e1220. Available from: https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1220
5. Prescott J. Examining the Economic Impact and Implications of Epilepsy. The American Journal of Managed Care [Internet]. 2020 Feb 13 [cited 2024 Nov 5]; Available from: https://www.ajmc.com/view/examining-the-economic-impact-and-implications-of-epilepsy
6. Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2016 (GBD 2016) Incidence, Prevalence, and Years

Lived with Disability 1990-2016. Seattle, United States of America: Institute for Health Metrics and Evaluation (IHME); 2017.

7. Shan T, Zhu Y, Fan H, Liu Z, Xie J, Li M, et al. Global, regional, and national time trends in the burden of epilepsy, 1990–2019: an age-period-cohort analysis for the global burden of disease 2019 study. Front Neurol [Internet]. 2024 Aug 15 [cited 2024 Nov 5];15:1418926. Available from: https://www.frontiersin.org/articles/10.3389/fneur.2024.1418926/full

8. Organization WH, Yip W, Hafez R. Improving health system efficiency: reforms for improving the efficiency of health systems: lessons from 10 country cases. 2015 [cited 2024 Nov 5]; Available from: https://iris.who.int/handle/10665/185989

9. Ali A. Global Health: Epilepsy. Semin Neurol [Internet]. 2018 Apr [cited 2024 Nov 5];38(02):191–9. Available from: http://www.thieme-connect.de/DOI/DOI?10.1055/s-0038-1646947

10. Stelzle D, Schmidt V, Keller L, Ngowi BJ, Matuja W, Escheu G, et al. Characteristics of people with epilepsy and Neurocysticercosis in three eastern African countries–A pooled analysis. Abd-Alla AMM, editor. PLoS Negl Trop Dis [Internet]. 2022 Nov 7 [cited 2024 Nov 5];16(11):e0010870. Available from: https://dx.plos.org/10.1371/journal.pntd.0010870

11. Kinyanjui DW, Kathuku DM, Mburu JM. Quality of life among patients living with epilepsy attending the neurology clinic at kenyatta national hospital, Nairobi, Kenya: a comparative study. Health Qual Life Outcomes [Internet]. 2013 [cited 2024 Nov 5];11(1):98. Available from: http://hqlo.biomedcentral.com/articles/10.1186/1477-7525-11-98

12. Roberts-Turner R, Shah R. Pocket Guide to Quality Improvement in Healthcare. 2021.

13. Zajac S, Woods A, Tannenbaum S, Salas E, Holladay CL. Overcoming Challenges to Teamwork in Healthcare: A Team Effectiveness Framework and Evidence-Based Guidance. Front Commun [Internet]. 2021 Mar 17 [cited 2024 Nov 5];6:606445. Available from: https://www.frontiersin.org/articles/10.3389/fcomm.2021.606445/full

14. Donabedian A. Evaluating the Quality of Medical Care. Milbank Quarterly [Internet]. 2005 Dec [cited 2024 Nov 5];83(4):691–729. Available from: https://onlinelibrary.wiley.com/doi/10.1111/j.1468-0009.2005.00397.x

15. World Health Organization. Epilepsy in the WHO African region: bridging the gap. Belhocine, M, de Boer, H, and Mandlhate, C Geneva. 2004;

16. Kissani N, Lengané YTM, Patterson V, Mesraoua B, Dawn E, Ozkara C, et al. Telemedicine in epilepsy: How can we improve care, teaching, and awareness? Epilepsy & Behavior [Internet]. 2020 Feb [cited 2024 Nov 5];103:106854. Available from: https://linkinghub.elsevier.com/retrieve/pii/S1525505019308807

17. Hesdorffer DC, Ishihara L, Webb DJ, Mynepalli L, Galwey NW, Hauser WA. Occurrence and Recurrence of Attempted Suicide Among People With Epilepsy. JAMA Psychiatry [Internet]. 2016 Jan 1 [cited 2024 Nov 5];73(1):80. Available from: http://archpsyc.jamanetwork.com/article.aspx?doi=10.1001/jamapsychiatry.2015.2516

18. Helmstaedter C, Sadat-Hossieny Z, Kanner AM, Meador KJ. Cognitive disorders in epilepsy II: Clinical targets, indications and selection of test instruments. Seizure [Internet]. 2020 Dec [cited 2024 Nov 5];83:223–31. Available from: https://linkinghub.elsevier.com/retrieve/pii/S1059131120303046

19. Wiebe N, Fiest KM, Dykeman J, Liu X, Jette N, Patten S, et al. Patient satisfaction with care in epilepsy: how much do we know? Epilepsia. 2014;55(3):448–55.

20. Kishk N, Mourad H, Ibrahim S, Shamloul R, Al-Azazi A, Shalaby N. Sex differences among epileptic patients: a comparison of epilepsy and its impacts on demographic features, clinical characteristics, and management patterns in a tertiary care hospital in Egypt. Egypt J Neurol Psychiatry Neurosurg [Internet]. 2019 Dec [cited 2024 Nov 5];55(1):39. Available from:

https://ejnpn.springeropen.com/articles/10.1186/s41983-019-0078-7

21. Makhado L, Maphula A, Ngomba RT, Musekwa OP, Makhado TG, Nemathaga M, et al. Epilepsy in rural South Africa: Patient experiences and healthcare challenges. Epilepsia Open [Internet]. 2024 Aug [cited 2024 Nov 5];9(4):1565–74. Available from: https://onlinelibrary.wiley.com/doi/10.1002/epi4.12999
22. Voitiuk AA. Epilepsy: Age and Gender Aspects. ANN [Internet]. 2019 May 29 [cited 2024 Nov 5];3(4). Available from: https://irispublishers.com/ann/fulltext/epilepsy-age-and-gender-aspects.ID.000570.php
23. Taylor J. The eff ects of faith on personality characteristics. The effects of faith on personality characteristics R etrieved November. 2018;3(2):0.
24. Jennum P, Debes NMM, Ibsen R, Kjellberg J. Long-term employment, education, and healthcare costs of childhood and adolescent onset of epilepsy. Epilepsy & Behavior [Internet]. 2021 Jan [cited 2024 Nov 5];114:107256. Available from: https://linkinghub.elsevier.com/retrieve/pii/S1525505020304352
25. Keikelame MJ, Swartz L. "I wonder if I did not mess up….": Shame and resistance among women with epilepsy in Cape Town, South Africa. Seizure [Internet]. 2018 Oct [cited 2024 Nov 5];61:50–6. Available from: https://linkinghub.elsevier.com/retrieve/pii/S1059131117308014
26. Jacoby A, Snape D, Baker G. Epilepsy and social identity: the stigma of a chronic neurological disorder. The Lancet Neurology [Internet]. 2005 Mar [cited 2024 Nov 5];4(3):171–8. Available from: https://linkinghub.elsevier.com/retrieve/pii/S147444220570020X
27. Swihart DL, Yarrarapu SNS, Martin RL. Cultural religious competence in clinical practice. 2018;
28. Seneviratne U, Cook M, D'Souza W. The prognosis of idiopathic generalized epilepsy. Epilepsia [Internet]. 2012 Dec [cited 2024 Nov 5];53(12):2079–90. Available from: https://onlinelibrary.wiley.com/doi/10.1111/j.1528-1167.2012.03723.x