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Epilepsy Prevalence and Determinants in Four Former Health Provinces of Burundi: A Mixed Methods Study

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ABSTRACT

Background: Epilepsy remains one of the most prevalent neurological disorders globally, particularly in low-resource settings. Understanding the factors associated with epilepsy, especially convulsive forms, is essential for effective prevention and control strategies. This study aimed to determine the prevalence of epilepsy and identify associated risk factors in four provinces of Burundi (Bujumbura Municipality, Gitega, Ngozi, and Rumonge, under the former administrative organisation).

Methods: A mixed-methods approach was employed, combining a cross-sectional survey and a concurrent qualitative component. The quantitative survey included 781 households within the catchment areas of selected health facilities. Data were analysed using simple and multiple block binary logistic regression, with the best-fitting model selected using the Bayesian Information Criterion.

Results: The overall prevalence rate of epilepsy was 10.9 per 10,000 people. Significant risk factors included consumption of local traditional beer, pork consumption, foetal distress, non-caesarean delivery, sadness as a reported trigger, and discontinuation of antiepileptic medications. The qualitative findings, based on in-depth interviews with people with epilepsy and their care providers, highlighted limited awareness of epilepsy, delays in diagnosis, difficulty accessing treatment, and persistent stigma. Observational visits to health facilities and private pharmacies further revealed frequent shortages of antiepileptic drugs and inadequate treatment availability.

Conclusion: Epilepsy continues to be a major public health challenge in Burundi. Reducing its burden will require increasing community awareness, enhancing early diagnosis and treatment through strengthened healthcare provider capacity, ensuring a reliable supply of antiepileptic medications, and improving access to care for vulnerable populations.

BACKGROUND

Epilepsy is one of the most common chronic neurological disorders globally. According to the WHO, over 50 million people are affected by epilepsy, with approximately 80% residing in low- and middle-income countries (LMICs).[1, 2] The high prevalence in these settings is largely attributed to increased exposure to risk factors such as infectious diseases (including malaria, neurocysticercosis, meningitis, and viral encephalitis), traumatic brain injuries, perinatal complications, and cerebrovascular accidents.[3,4] Individuals living with epilepsy face a risk of premature mortality that is up to three times higher than that of the general population[4] Epilepsy is associated with a broad range of neurobiological, cognitive, psychiatric, social, and economic consequences.[4,5] Comorbid psychiatric conditions, particularly depression and anxiety, are common and can substantially impair quality of life. Socially, individuals with epilepsy often experience stigma and discrimination, which further exacerbate their psychosocial burden.

Economically, the disorder contributes to increased healthcare utilization and reduced work productivity. In low- and middle-income countries, the overall burden of epilepsy may be mitigated through targeted strategies such as prevention of modifiable risk factors, reduction of stigma and discrimination, improved access to diagnostic and treatment services, and consistent availability of antiepileptic medications for routine care.[5-7] The stigma and discrimination associated with epilepsy often have a profound impact on the mental health and well-being of affected individuals, sometimes proving more challenging than the seizures themselves. Stigma poses a significant burden not only for people living with epilepsy but also for their families. This social stigma largely stems from widespread misconceptions and a lack of understanding about the condition.

Historically, epilepsy has been misperceived as an incurable illness of supernatural origin, and in some communities, it is still wrongly believed to be contagious. Improving community knowledge and awareness, particularly in settings such as schools, is recognised as a key strategy in combating epilepsy-related stigma. Evidence suggests that approximately 70% of people with epilepsy could live seizure-free with appropriate treatment, primarily through consistent access to antiepileptic medications, which are both effective and cost-efficient (approximately US$5 per year).[4] However, nearly 75% of individuals with epilepsy in low-income countries lack access to such treatment.[8,9] Uninterrupted access to antiepileptic drugs (AEDs) remains a major barrier to effective epilepsy treatment in low- and middle-income countries.[10] Recent data indicate that in these settings, AEDs are available in the public sector only about 50% of the time.[4]

To identify the determinants of epilepsy in Burundi, it was essential to conduct a prevalence study and actively identify people living with epilepsy in the community. However, many individuals with epilepsy remain undiagnosed or unrecognised for several reasons. Stigma often discourages affected individuals and their families from seeking medical care, leading them instead to consult traditional healers or seek help from prayer centres. In addition, limited public awareness of the diverse clinical manifestations of epilepsy contributes to under-recognition of the condition. This challenge is further exacerbated by a shortage of healthcare professionals with specialised training in epilepsy, as well as financial barriers that restrict access to appropriate diagnostic and treatment services.

However, conducting a study at the national level requires substantial resources. Therefore, this study was limited to the intervention area of the "Ni abacu" project (the municipality of Bujumbura and the health provinces of Gitega, Ngozi, and Rumonge).[11,12] A broader, nationwide study will be considered based on the findings and outcomes of this initial research. The study aligns with the objectives of the Intersectoral Global Action Plan (IGAP) on epilepsy and other neurological disorders, which aims to improve access to care and treatment for individuals living with neurological conditions, prevent new cases, and promote brain health and development throughout the life course.[1] This research provides a foundational basis for the analysis of potential strategic measures and interventions that could enhance the prevention and management of epilepsy in Burundi. The primary aim of the study was to determine the prevalence of epilepsy and to identify its associated factors within the intervention zones of the "Ni abacu" project, specifically in the municipality of Bujumbura and the health provinces of Gitega, Ngozi, and Rumonge.

METHODS

Study Design and Setting

We conducted a cross-sectional study. This study employed a mixed-methods approach with both quantitative and qualitative components. The quantitative component used a community-based cross-sectional design, while the qualitative component involved in-depth interviews. The study was conducted in the intervention zones of the "Ni abacu" project, covering four health provinces in Burundi: Bujumbura Mairie, Gitega, Ngozi, and Rumonge. The objective was to generate representative findings for each of these provinces.

Study Population and Eligibility Criteria

The target population included all individuals aged 6 years and above residing in the selected clusters. Children under 6 were excluded to avoid confusion between epileptic seizures and febrile seizures. Individuals who were unable to express themselves adequately and had no available proxy were excluded. For participants under 18 years of age, informed consent was obtained from a parent or legal guardian. In addition, verbal assent was obtained from adolescents when appropriate, depending on their age and ability to understand the study. The interview questions were carefully framed to ensure clarity, appropriateness, and consistency when administered to family care providers acting as proxy respondents.

Sample Size and Sampling Procedure

The minimum sample size was calculated using the Schwartz formula for prevalence studies;

$$n = \frac{z^2 \times p(1-p)}{i^2}.$$

Where z=1.96 for a 95% confidence level, i= margin of error (3.5%), *P*=estimated epilepsy prevalence (6.68 per 1,000 based on data from low-income countries).[4,13,14] This yielded a minimum sample size of 696 participants.

A three-stage cluster sampling method was employed. In the first stage, seven health districts (HDs) were randomly selected from the 12 located across the four intervention provinces. In the second stage, within each selected district, four clusters (health centres, HCs) were randomly chosen, resulting in a total of 28 clusters; each cluster included at least one hill (an administrative unit) under the CDS. In the third stage, at least 27 households per cluster were voluntarily selected, and one eligible individual was randomly chosen from each household for inclusion in the study. Participants were then systematically enrolled with the support of health promotion technicians and community health workers until the required sample size per cluster was achieved.

Data Collection

Quantitative Component

Data were collected using a structured, pre-tested questionnaire that was programmed and deployed through KoBoCollect for digital data capture. The questionnaire gathered information on sociodemographic characteristics, medical history, potential epilepsy risk factors, and access to health care services. Key independent variables included age, sex, residence, and hill of origin, as well as family history of epilepsy (both first-degree and extended relatives), history of febrile seizures among relatives, and exposure to head trauma such as road traffic accidents, falls, or violence.

Additional independent variables focused on perinatal and early-life factors, including premature birth, low birth weight, prolonged or difficult labour, neonatal distress,

seizures within the first week of life, and breastfeeding difficulties. Nutritional habits, such as pork consumption, were also assessed alongside participants' knowledge of epilepsy and access to primary health care services related to epilepsy.

The dependent variable, probable epilepsy, was assessed using a modified version of the Oxford Convulsive Epilepsy Screening Tool. A participant was classified as having probable epilepsy if they answered "Yes" to at least one core screening question, such as experiencing seizures or being told they had seizures or having episodes of jerky limb movements or loss of consciousness.

Participants meeting the diagnostic criteria described by John G.D. et al.[15]. were further categorised using a scoring threshold, with probable epilepsy defined as a score (G) ≥ 62% and no epilepsy as G < 62%. The prevalence of epilepsy was calculated using the formula: (Total epileptics in the selected hill × 100) / (Total population × 0.79), with 79% representing the estimated proportion of the Burundian population aged 6 years and above.[16]

Qualitative Component

In-depth interviews were conducted with people living with epilepsy aged 18 years and above, parents or guardians of children with epilepsy, as well as key stakeholders such as pharmacists and managers of private pharmaceutical outlets within the study area. No in-depth interviews were conducted directly with children under 18 years of age. All interviews were conducted in private settings, with participant consent, and with strict adherence to ethical principles of respect, confidentiality, and voluntary participation.

Data Analysis

Quantitative data were exported and analysed using STATA version 17. Descriptive statistics, including absolute, relative, and cumulative frequencies, were used to summarize participant characteristics and estimate epilepsy prevalence. Bivariate analysis was conducted using simple log-linear regression to assess the association between epilepsy prevalence rate and potential predictor variables. Variables with a *P value* < .20 in the bivariate analysis were subsequently entered into a multivariate log-linear regression model. A backward elimination procedure was applied, retaining variables at a significance level of $P<.05$ Model selection was guided by the Bayesian Information Criterion (BIC). Results were presented as coefficients (Coef) with corresponding 95% confidence interval (CI). Only variables that demonstrated statistically significant associations with the outcome in the final model were retained and reported in the results section.

Qualitative data analysis followed a systematic multi-step process, beginning with reading transcripts multiple times to familiarise ourselves with the data and identify initial patterns and meanings. An initial coding framework was then developed by two members of the research team, and data were coded using OpenCode version 4.02, with codes assigned to meaningful units of text reflecting participants' experiences, perceptions, and reported barriers. Next, similar codes were grouped into broader categories and organised into potential themes, which were iteratively reviewed and refined through comparison with the original transcripts to ensure internal consistency and alignment with participants' narratives. Any differences in coding or theme interpretation were addressed through team discussions until a consensus was achieved. Finally, themes were clearly defined, refined, and named to reflect the underlying meanings in the data, and representative quotations were selected to illustrate each theme and strengthen interpretation and presentation of the findings. These refined themes were then used to complement and contextualise the quantitative results within an integrative mixed-methods interpretation.

Ethical Considerations

The study protocol was reviewed and approved by the Ethics and Bioethics Committee of the Faculty of Medicine at CHUK, under reference number FM/CE/01/01/2024. In addition, official authorizations were obtained from relevant government bodies, including the Ministry of Public Health and the Fight against AIDS (Authorization No. 630/5973/CAB/2024, dated August 28, 2024), and the Ministry of the Interior, Community Development and Public Security (Authorization No. 530/6771/CAB/2024).

An informed consent form was developed in French, translated into Kirundi, and read aloud to each participant or, in the case of minors, to their parent or guardian. Verbal informed consent was obtained prior to participation, with assurance of confidentiality, anonymity, and the right to withdraw at any point without consequence.

RESULTS

Quantitative Results

Screening Outcomes and Prevalence of Epilepsy

Of the total participants screened, nearly one-third, 251 (32.2%), reported a history of seizures, while 283 (36.3%) reported episodes of jerky or involuntary movements. Among participants with a history of seizures, 203 (70.7%) reported visual hallucinations during episodes, and 202 (69.7%) reported tongue biting. In addition, 208 (71.5%) experienced urinary incontinence, while 187 (64.9%) reported associated abdominal discomfort (Table 1).

Altered consciousness was highly prevalent among respondents describing seizure episodes. A total of 270 participants (93.1%) reported loss of awareness or disconnection from their surroundings, and 273 (93.8%) were described as appearing dazed during events. Motor manifestations were also common, with 260 participants (89.7%) reporting body stiffening. Furthermore, 172 individuals (60.1%) identified specific triggers that they believed precipitated their seizure episodes.

As shown in Table 2, the overall prevalence of epilepsy across the four provinces was 10.9 per 10,000 population. Marked regional variation was observed. The highest prevalence was recorded in Rumonge Province (22.56 per 10,000), followed by Gitega (13.09 per 10,000) and Ngozi (11.26 per 10,000), while the municipality of Bujumbura recorded the lowest prevalence (3.65 per 10,000). Overall, the prevalence observed in this study was substantially lower than the reported average in low-income countries (66.8 per 10,000).

TABLE 1: Prevalence of Reported Seizure History and Related Symptoms Among Participants

Symptom or Event	Freq.	%
History of Seizure	251	32.2*
Episodes of jerky movements	283	36.3*
Visual hallucinations ("seeing strange things")	203	70.7**
Abdominal discomfort during episodes	187	64.9**
Tongue biting	202	69.7**
Urinary incontinence during these episodes ("being wet during")	208	71.5**
Loss of contact with environment	270	93.1**
Dazed appearance during episodes	273	93.8**
Body stiffening	260	89.7**
Seizures episodes triggered by specific factors	172	60.1**

* Percentages calculated for 780 study participants
**Percentages calculated among participants who reported having seizures (n = 287).

TABLE 2: Prevalence Estimates by Health Facility Catchment Area*

Area	Prevalence rate Per 10,000 people
Bujumbura-Municipality	3.65
Mutha	3.4
Ntahangwa	3.9
Gitega Province	13.09
Gitega	21.3
Mutaho	18.2
Bugendana	3.7
Bukirasazi	20.3
Buraza	1.99
Ngozi Province	11.26
Buye	9.52
Kiremba	22.56
Ngozi	1.72
Rumonge Province	22.56
Muhuta	11.96
Rumonge	33.16
All provinces	10.9 (95% IC : 10.2-11.7)

*Prevalence rates were calculated based on the estimated total population of each health facility catchment area and expressed per 10,000 population.

Factors Associated with Prevalence Rate of Epilepsy and Qualitative Perspectives

Multivariate log-linear regression analysis identified several sociodemographic, behavioural, and perinatal factors significantly associated with the prevalence of epilepsy. The best-fitting model, selected on the basis of the lowest Bayesian Information Criterion (BIC = 2993.736), outperformed the two alternative models considered (BIC = 2995.483 and 2997.368) (Table 3).

Sociodemographic Factors

Occupation was significantly associated with epilepsy status (P<.01). Compared with farmers/breeders (reference category), being unemployed (Coef = 0.04; 95% CI: 0.02 to 0.05), working in the private sector (Coef = 0.05; 95% CI: 0.04 to 0.07), or being a student (Coef = 0.02; 95% CI: 0.01 to 0.03) were all positively associated with epilepsy. In contrast, no statistically significant association was observed among employees or civil servants (Coef = 0.01; 95% CI: –0.02 to 0.04). When stratified by place of residence, the prevalence of epilepsy was lower in urban households, with an estimated difference of approximately 6 cases per 10,000 population compared with rural households.

Qualitative Findings

The qualitative data highlighted the influence of social stigma and misconceptions surrounding epilepsy, particularly in rural settings. Participants frequently attributed epilepsy to evil spirits or supernatural causes, which contributed to social isolation and delayed healthcare seeking. One mother noted, "In my neighbourhood, they say a child with epilepsy is possessed by evil spirits." Similarly, a young man in his thirties stated,

"Because of my condition, I have never dared to get engaged or even consider starting a family." These accounts illustrate the substantial psychosocial burden experienced by persons living with epilepsy and their families.

Behavioral Factors (Eating and Drinking Habits)

Consumption of local traditional beer, compared with industrial beer, was significantly associated with epilepsy (Coef = 0.064; 95% CI: 0.017 to 0.11; P<.001). In contrast, frequency of pork consumption was not significantly associated with epilepsy (P=.976), regardless of level of intake. Qualitative findings further indicated limited knowledge of epilepsy and persistent misconceptions regarding its aetiology. A mother of an adolescent boy with epilepsy explained:

"My son started having epileptic seizures at the age of 2 years and 7 months, and I did not know what it was. Some told me it was evil spirits, others said it was due to fever." Such beliefs were commonly reported to contribute to delays in seeking biomedical care.

Perinatal and Birth-related Factors

Among the five childbirth-related factors assessed, foetal distress at birth and non-caesarean delivery were significantly associated with an increased prevalence of epilepsy. In the bivariate analysis, foetal distress was linked to an increase of 7.9 cases per 10,000 population, while non-caesarean birth was associated with an increase of 1.7 cases per 10,000 population. Place of birth was significantly associated with epilepsy (P=.018), with births at health facilities showing a negative association compared to home births (Coef = –0.02; 95% CI, –0.04

TABLE 3: Factors Associated with Epilepsy (Crude and Adjusted Regression Analysis)

Variable/Category	Crude β (95% CI)	*P value*	Adjusted β (95% CI)	*P value*
Occupation				
Overall		<.01		<.01
Farmer/Breeder	Ref		Ref	
Pupil/Student	-0.01 (-0.03–0.01)	.01	0.02 (0.01–0.03)	
Employee/Civil servant	-0.03 (-0.07–0.02)		0.01 (-0.02–0.04)	
Unemployed	0.04 (0.02–0.05)		0.04 (0.02–0.05)	
Private sector	0.05 (0.02–0.08)		0.05 (0.04–0.07)	
Beer consumption				
Overall		<.01		
Industrial beer	Ref		Ref	
Local traditional beer	0.07 (0.046–0.089)		0.064 (0.017–0.110)	<.001
Pork consumption				
Overall		<.01		.976
>1/month	Ref		Ref	
Once/week	0.10 (0.073–0.132)		0.004 (-0.09–0.10)	
>1/week	0.04 (0.002–0.073)		0.056 (-0.03–0.14)	
Once/month	0.06 (0.032–0.085)		0.057 (-0.02–0.14)	
Twin birth				
No	Ref		Ref	
Yes	0.06 (0.019–0.095)	<.01		
Place of birth				
Home	Ref		Ref	
Health facility	-0.01 (-0.03–0.003)	.11	-0.02 (-0.04–0.00)	.018
Foetal distress				
No (cried at birth)	Ref		Ref	
Yes (did not cry)	0.079 (0.058–0.100)	<.01	0.083 (0.061–0.104)	<.01
Type of delivery				
Caesarean section	Ref		Ref	
Non-caesarean	0.017 (0.014–0.049)	.02	0.034 (0.002–0.066)	.038
Family history of epilepsy				
Siblings	Ref		Ref	
Grandparents/Aunts/Uncles	-0.01 (-0.05–0.02)	<.01	0.003 (-0.07–0.08)	.90
Parents	0.05 (0.007–0.10)		0.012 (-0.07–0.09)	
Trigger: sadness				
No	Ref		Ref	
Yes	0.061 (0.032–0.089)	<.01	0.50 (0.28–0.89)	<.01
Treatment discontinuation				
No	Ref			.049
Yes	0.029 (0.001–0.059)			
Narcotic/toxic exposure				
No	Ref		Ref	
Yes	0.164 (0.127–0.201)	<.001		

β = regression coefficient; CI = confidence interval. Ref = reference category. Values represent crude and adjusted regression models. *p*-values correspond to regression coefficients unless otherwise stated.

to –0.00). Foetal distress at birth was strongly associated with epilepsy (*P*<.01), particularly when the newborn did not cry and required immediate intervention (Coef. = 0.083; 95% CI, 0.061 to 0.104). Type of birth was also a significant factor (*P*=.038), with non-caesarean delivery associated with increased risk compared to caesarean section (Coef = 0.034; 95% CI, 0.002 to 0.066).

Seizure Triggers (Precipitants)

Episodes triggered by sadness were significantly associated with epilepsy (Coef. = 0.50; 95% CI, 0.28 to 0.89; *P*<.01).

Data regarding triggers related to discontinuation of antiepileptic treatment and the use of narcotic substances or toxic agents were reported but lacked corresponding coefficients or statistical significance and could not be fully evaluated in this model. However, one of the qualitative findings revealed substantial challenges related to treatment, particularly barriers to accessing antiepileptic drugs (AEDs).

Access to AEDs was described as highly challenging. Many family care providers referred to it as a "way of the

cross". A mother from the Rutegama CDS zone said:
"Getting the medicine is like an obstacle course." A nurse in Mutaho added:
"My patient only takes treatment when he can get it at the public health centre. Otherwise, he stops because he can't afford it."

A mother from Buraza stated:
"I buy the medicine in Gitega. It takes me the whole day, and with transport costs, all my savings disappear."

Family History and Twin Status

Family history of epilepsy and twin status were not significantly associated with epilepsy in this model (p=.9 for family history). The twin variable lacked coefficient data and could not be interpreted.

Qualitative Insights into Lived Experiences

The qualitative analysis generated three interrelated themes from interviews with family care providers, patients, and health professionals, illustrating how epilepsy is understood, managed, and experienced in the study setting. These themes show the interaction between knowledge gaps, health system constraints, and strong psychosocial consequences.

The first theme concerns limited knowledge, misconceptions, and delayed diagnosis, which strongly influenced early responses to seizures. Participants frequently described poor understanding of epilepsy and its causes, with many initially attributing seizures to supernatural or non-medical explanations. One mother explained:

"My son started having epileptic seizures at the age of 2 years and 7 months, and I didn't know what it was. Some told me it was evil spirits; others said it was due to fever."

Community narratives reinforced such beliefs and delayed recognition and formal diagnosis. In some cases, diagnosis was delayed for years, as illustrated by a family care provider who noted:

"At least two years passed between my daughter's first tonic-clonic seizure and the diagnosis. I thought they would just go away, as the rumour circulated around our neighbourhood."

The second theme relates to barriers to treatment access and health system constraints, which limited continuity and effectiveness of care. Participants reported difficulties obtaining antiepileptic drugs due to frequent stock-outs, long travel distances, and inconsistent availability across facilities. Facility assessments confirmed that only a small number of district hospital pharmacies stocked any antiepileptic drugs, and only one had injectable phenobarbital available. Private pharmacies were similarly affected, with stock-outs lasting from two weeks to three months. In addition, inappropriate substitutions were sometimes offered, as illustrated by the prescription of antipsychotic medication such as Dipiperon (40 mg) in place of antiepileptic drugs, highlighting critical gaps in treatment provision. These structural barriers contributed to inconsistent medication use and ongoing seizure recurrence.

The third theme encompasses social stigma, isolation, and psychosocial burden, which profoundly affected patients and families. Epilepsy was widely associated with supernatural beliefs and social exclusion. A family care provider reported,

"In my neighbourhood, they say a child with epilepsy is possessed by evil spirits."

For patients, stigma translated into long-term social restriction and reduced life opportunities. A young man in his thirties shared:

"Because of my condition, I've never dared get engaged or even think of starting a family."

These accounts illustrate the extensive emotional and social consequences of epilepsy, which extend beyond the clinical condition itself.

Overall, these qualitative findings complement the quantitative results by showing how misconceptions, delayed diagnosis, weak health system capacity, and stigma interact to shape the lived experience of epilepsy in the study population.

DISCUSSION

In this study, the estimated prevalence of epilepsy was 10.9 cases per 10,000 population. This appears lower than the average prevalence reported in low-income countries (66.8/10,000). The prevalence identified in our study (10.9 per 10,000 population) is substantially lower than the average prevalence reported in low-income countries and may reflect, at least in part, under-ascertainment rather than a truly lower burden of epilepsy. Several factors may have contributed to underestimation. First, to avoid confusion between epileptic seizures and febrile seizures, children younger than six years were not included in the survey, although epilepsy frequently begins during childhood.[4] Second the study relied on a symptom-based screening questionnaire without systematic repeated neurological assessment or electroencephalographic confirmation, which may have reduced sensitivity for detecting focal, absence, nocturnal, or atypical seizures[18]. In addition, cultural interpretations of seizure symptoms may have influenced participant responses. Epilepsy-related stigma in many sub-Saharan African settings may have resulted in underreporting due to fear of discrimination or social exclusion.[6]

Our estimated prevalence of epilepsy of 10.9 cases per 10,000 population is consistent with findings from other African settings. For example, in Kilifi, Kenya, the prevalence of active convulsive epilepsy was 4.5 per 1,000 persons, representing a quarter of the active epilepsy burden in that region.[19] This estimate also aligns closely with a point prevalence of 6.38 per 1,000 persons (95% CI, 5.57 to 7.30) reported in a recent systematic review and meta-analysis.[14] Our findings also revealed a significant association between alcohol consumption, particularly local traditional beer, and epilepsy. This is in line with previous studies that identified alcohol use as a risk factor for epilepsy.[20-23] Alcohol may contribute to seizure onset through mechanisms such as sleep deprivation, poor nutrition, or non-adherence to medication.[19-24]

Importantly, treatment discontinuation was significantly associated with uncontrolled epilepsy. This aligns with earlier studies identifying non-adherence to antiepileptic drugs (AEDs) as a leading cause of poor seizure control.[25,26] These results underscore the need for targeted educational programmes to improve patient adherence and awareness about epilepsy management.

Perinatal factors such as fetal distress and non-cesarean delivery were also significantly associated with epilepsy in our study. These findings are consistent with previous research, which highlights antenatal and perinatal complications as strong predictors of epilepsy, especially in children[6] . Genetic predisposition was another key factor. The presence of epilepsy in one or both parents was strongly associated with increased prevalence, a finding supported by studies conducted in Taiwan and Ethiopia.[27, 28] However, our results contrast with those of Karatoprak et al., who found that parental consanguinity and birth from a primiparous mother were not significant risk factors.[29] Given the cross-sectional design and reliance on retrospective recall, temporality cannot be firmly established, and some observed perinatal factors may reflect underlying neurological vulnerability rather than independent causal risk factors.

We did not examine the association between malaria and epilepsy, although previous studies have documented a potential link, particularly in pediatric populations.[30] Sociodemographic characteristics also played a role. Low educational attainment and residence in rural areas were associated with increased epilepsy prevalence, which is consistent with findings from other low-resource settings.[31-33] Moreover, epilepsy care in Burundi remains inconsistent, with significant variability in diagnosis and treatment depending on the availability of trained personnel and medical resources. Similar challenges have been reported in other low-income countries.[34,35] Regarding prognosis, our findings align with the classification proposed by Sander, which categorizes epilepsy outcomes into four groups: excellent prognosis (20 to 30%), characterized by a high likelihood of spontaneous remission; good prognosis (30 to 40%), where seizures are well controlled with medication and may remit; uncertain prognosis (10 to 20%), marked by variable treatment response and possible relapse after withdrawal; and poor prognosis (20%), in which seizures persist despite intensive.[25] These classifications emphasize the critical role of sustained pharmacological treatment in managing epilepsy and improving patient outcomes.

Study Limitations

The observed prevalence should be interpreted cautiously and may represent a conservative estimate of the true burden of epilepsy in Burundi rather than definitive evidence of a lower national prevalence. The cross-sectional design of this study limits the ability to infer causal relationships between the identified risk factors and epilepsy, as exposure and outcome were assessed at the same time.

CONCLUSION

This cross-sectional study estimates the prevalence of epilepsy and its associated factors across four former health provinces. The overall prevalence was 10.9 per 10,000 population, with notable regional variation.
Epilepsy was significantly associated with several sociodemographic and perinatal factors, including occupation, rural residence, consumption of locally brewed traditional alcohol, and adverse birth outcomes such as foetal distress and non-caesarean delivery.

The qualitative findings complemented the quantitative results by providing contextual explanations that were not captured in the survey data. In particular, they highlighted sociocultural perceptions and health-system barriers influencing care-seeking behaviour, diagnosis, and access to treatment. These insights are important for informing awareness-raising initiatives, improving early detection strategies, and strengthening the availability and continuity of antiepileptic medications in Burundi.

Overall, the findings emphasise the need for integrated epilepsy control strategies that address both biomedical and sociocultural determinants. Such strategies should combine community education, strengthened perinatal care, improved access to antiepileptic drugs, and enhanced capacity of primary healthcare services. A multisectoral response involving both the health system and community stakeholders is essential to reduce the burden of epilepsy and improve outcomes for affected individuals in Burundi.

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