

Determinants of Patients' Attitudes toward Neurosurgery: Insights from Togo

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How to cite this paper: Doléagbéno, A.K., Béléyi, L., Békéti, A.K. and Kpélao, E. (2025) Determinants of Patients' Attitudes toward Neurosurgery: Insights from Togo. *World Journal of Neuroscience*, 15, 280-292.
<https://doi.org/10.4236/wjns.2025.154023>

Received: May 16, 2025

Accepted: October 21, 2025

Published: October 24, 2025

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Abstract

Background: Access to neurosurgical care in sub-Saharan Africa is constrained not only by limited infrastructure and workforce shortages but also by patient perceptions. No study has previously examined these determinants in Togo. This study assessed patients' knowledge, perceptions, and attitudes toward neurosurgery and identified factors that influence their acceptance of care. **Methods:** We conducted a cross-sectional survey of 374 patients at CHU Sylvanus Olympio in Lomé, Togo, from March to June 2024. A structured questionnaire captured sociodemographic data, knowledge of neurosurgery, cost perceptions, willingness to undergo surgery, and preferences for surgeons. Associations between determinants and attitudes were tested using chi-square analysis. **Results:** Most participants (78.1%) were unable to define neurosurgery, and two-thirds (67.9%) were unaware of its existence in Togo—nearly 90% perceived neurosurgery as prohibitively expensive. Only 58.3% would accept surgery if indicated, with higher acceptance among educated patients, those who understood their diagnosis, and those who believed in recovery ($p < 0.05$). A majority preferred to be operated on by a professor, and 66.6% would seek surgery abroad, citing better infrastructure as the reason. **Conclusion:** Patients in Togo demonstrate limited knowledge and significant concerns about neurosurgical care, shaped by education, health literacy, and socio-economic factors. Strengthening public awareness, enhancing physician-patient communication, expanding financial protection, and investing in local capacity are crucial to reducing reliance on care abroad and fostering trust in national services.

Keywords

Neurosurgery, Patients' Attitudes, Health Perceptions, Global Health, Togo,

Sub-Saharan Africa

1. Introduction

In low- and middle-income countries (LMICs), there is a lack of access to safe, timely, and affordable neurosurgical care [1] [2]. Each year, over 18 million people die due to the absence of essential and emergency neurosurgical care in LMICs [2] [3]. This burden is particularly pronounced in Africa, where resource constraints and multiple barriers to care exacerbate the problem [4].

Although global health efforts in Africa have expanded in recent decades, the focus has remained mainly on infectious and non-communicable diseases [5]. As a result, surgical specialties such as neurosurgery have received suboptimal resource allocation, even though surgical and neurological disorders are leading causes of death and disability worldwide [3] [5] [6]. Africa alone accounts for 15% of the unmet global neurosurgical need, but has access to only 1% of the neurosurgical workforce [5].

For African patients, the barriers to neurosurgical care are multifaceted. Services and personnel are concentrated in urban centers, financial protection mechanisms are lacking, and public awareness of neurosurgery remains limited [7]. Beyond structural challenges, patients' perceptions and cultural beliefs also influence whether they seek appropriate care. Healthcare-seeking behavior (HSB), defined as "any action or inaction undertaken by individuals who perceive themselves to have a health problem or to be ill to find an appropriate remedy," is shaped by personal characteristics, socio-economic status, physical environment, health costs, and service availability [8]. In some countries, such as Nigeria and Ethiopia, for example, patients believe that cranial diseases are often attributed to supernatural causes, leading patients to pursue traditional medicine or spiritual healing instead of neurosurgical treatment [2].

These misconceptions and inappropriate HSBs represent significant barriers to care. Understanding patient attitudes is therefore essential to address these gaps. In Togo, where neurosurgical resources are scarce, there is limited knowledge about public awareness, perceptions, and willingness to seek neurosurgical care. To address this knowledge gap, we aimed to assess patients' understanding of neurosurgery, their knowledge of service availability, and their readiness to seek neurosurgical care services in Togo.

2. Patients and Methods

2.1. Togo Information [9]

Togo is a low-income, French-speaking country in West Africa, with an estimated population of 8.8 million as of 2023. The country's gross domestic product (GDP) was approximately USD 8.6 billion, and the gross national income per capita reached around USD 880. The CFA franc (XOF) serves as Togo's currency, with

an exchange rate of approximately 600 XOF to the US dollar. In 2021, the life expectancy at birth was 62.3 years, and the working-age population (ages 15 - 64) comprised nearly 55% of the total population. Urban residents constituted 43.5% of the population, while the national poverty rate remained high at 45.5%. The minimum monthly wage is roughly USD 33.

The national health system is organized into three levels: primary care at health centers, secondary care in regional hospitals, and tertiary care in university hospitals, such as CHU Sylvanus Olympio in Lomé. This referral center provides emergency and neurosurgical services, but it faces challenges related to intensive care capacity and equipment shortages.

Since 2021, the Togolese government has gradually introduced a Universal Health Insurance program, known as Assurance Maladie Universelle (AMU), to reduce financial barriers to healthcare access. However, as of 2024, insurance coverage remains limited, and most patients still pay out of pocket for their healthcare needs, including consultations, diagnostic tests, medications, and surgeries. Hospitalization costs range from USD 10 to USD 12 per day, and a brain CT scan costs between USD 42.50 and USD 150, depending on the institution.

2.2. Study Design and Setting

We conducted a descriptive, cross-sectional, and analytical study over three months, from March 1 to June 30, 2024, in the neurosurgery department of Sylvanus Olympio University Teaching Hospital (CHU Sylvanus Olympio) in Lomé, Togo.

2.3. Study Population

The target population included all patients aged 18 years and older admitted to the neurosurgery department.

2.4. Inclusion Criteria

Patients were eligible for inclusion if they:

- Aged 18 years and older;
- Provided informed consent;
- Could answer the questionnaire.

2.5. Exclusion Criteria

We excluded:

- Patients younger than 18 years old;
- Patients with impaired consciousness, communication disorders;
- Patients who declined to participate.

2.6. Definitions

- **Professor of Neurosurgery** refers to a senior academic neurosurgeon who holds a university faculty appointment in addition to clinical responsibilities.

- **A doctor of neurosurgery** is a qualified neurosurgeon without an academic title.

2.7. Data Collection and Variables

Data were collected using a structured questionnaire that was developed after a review of previous studies on patient attitudes toward neurosurgery and healthcare-seeking behavior in sub-Saharan Africa [2] [6] [10]. The questionnaire items were adapted to the Togolese context in consultation with neurosurgeons and public health specialists. Before data collection, the tool was pre-tested with a pilot group of 20 patients at the same hospital to assess clarity and cultural appropriateness.

The following variables were assessed:

- Sociodemographic characteristics (age, sex, level of education, occupation);
- Clinical information;
- Knowledge of neurosurgery;
- Perceptions of neurosurgical care;
- Awareness, attitudes, and readiness to seek neurosurgical care services.

2.8. Ethical Considerations

The Bioethics Committee approved this study for Health Research from the Togo Ministry of Health (“Comité de Bioéthique pour la Recherche en Santé (CBRS),” Ref No: 0101/2016/MS/CAB/DGS/DPLET/CBRS). Data were anonymized to ensure confidentiality. Written informed consent was obtained from all participants before enrollment.

2.9. Statistical Analysis

Data were analyzed using Epi Info version 7.5.2.0. Associations between categorical variables were assessed using the chi-square test, with significance set at $p < 0.05$.

3. Results

3.1. Socio-Demographic Data

The study included 374 participants. The mean age was 41.79 ± 15.38 years, with a range of 22 to 85 years. There were 213 men (56.95%) and 161 women (43.05%), giving a sex ratio of 1.32. 48.93% of participants had completed secondary school, 16.84% had completed primary school, 21.66% had reached the university level, and 12.57% had never attended school. The socio-economic level was classified as unfavorable for 78.34% ($n = 293$) of the participants.

3.2. Definition of Neurosurgery and Knowledge Level

Table 1 shows that 78.08% of participants were unable to define neurosurgery. Furthermore, 67.91% of participants were unaware of its existence in Togo. Among those who were aware of it, only 8.56% were able to estimate the number of neurosurgeons practicing in the country.

Table 1. Participants' knowledge levels.

Concept evaluated	n	%
Definition of neurosurgery (n = 374)		
Does not know how to define	292	78.08
Knows how to define	82	21.92
Does neurosurgery exist in Togo? (n = 374)		
No	254	67.91
Yes	120	32.09
Do you know the number of neurosurgeons? (n = 374)		
No	342	91.44
Yes	32	8.56
Estimated number of neurosurgeons (n = 32)		
≤10	20	62.50
11 - 20	7	21.87
≥21	5	15.63

3.3. Attitude towards Neurosurgery

Table 2 summarizes participants' different perceptions:

- **Cost of interventions:** 89.04% (n = 333) of participants considered neurosurgery procedures to be expensive.
- **Acceptance of a neurosurgical procedure:** 58.29% (n = 218) of participants would accept a neurosurgical procedure if it were indicated.
- **Choice of operator:** among those who accepted a neurosurgical procedure, 61.47% (n = 134) preferred to be operated on by a neurosurgery professor, compared to 35.32% (n = 77) by a doctor of neurosurgery.
- **Perceived outcomes:** 37.97% (n = 142) associated neurosurgery with a risk of disability, while 27.81% (n = 104) associated it with a possible cure.
- **Care abroad:** 66.58% (n = 249) estimated they could undergo care abroad because of better medical infrastructures.

Table 2. Participants' attitudes toward neurosurgery.

Variable	n	%
Cost of neurosurgical interventions (n = 374)		
Expensive	333	89.04
Not expensive	41	10.96

Continued**Would you accept surgery if indicated? (n = 374)**

Yes	218	58.29
No	156	41.71

Preferred operator (n = 218)

Professor of neurosurgery	134	61.47
Doctor of neurosurgery	77	35.32
Female neurosurgeon	7	3.21

Meaning of neurosurgery in Togo (n = 374)

Risk of disability	142	37.97
Cure	104	27.81
Risk of death	68	18.18
No improvement	41	10.96
Risk of recurrence	19	5.08

Would you undergo surgery abroad if possible? (n = 374)

Yes	249	66.58
No	125	33.42

Reasons for choosing abroad (n = 249)

Better infrastructures	213	85.54
Better skills	20	8.03
Better overall management	16	6.43

3.4. Information About the Diagnosis

A total of 266 participants (71.12%) reported having been sufficiently informed about the diagnosis. 242 (90.98%) received information from the neurosurgeon. Among them, 199 (82.33%) stated they understood the explanations given.

3.5. Determinants of Patients' Attitudes

The analysis of factors influencing patients' attitudes revealed multiple associations across socio-demographic and perception-related variables.

- **Perception of treatment cost**

Patients from lower socioeconomic backgrounds were significantly more likely to perceive neurosurgical procedures as expensive ($p = 0.02$). However, age, sex, and educational level were not significantly associated with cost perception (**Table 3**).

Table 3. Factors influencing perception of treatment cost in neurosurgery.

Variable	n	Not expensive n (%)	Expensive n (%)	Chi ²	p-value
Age (years)				11.70	0.069
[16 - 25[	54	11 (20.37)	43 (79.63)		
[25 - 35[	91	6 (6.59)	85 (93.41)		
[35 - 45[	95	10 (10.53)	85 (89.47)		
[45 - 55[	45	6 (13.33)	39 (86.67)		
[55 - 65[	53	3 (5.66)	50 (94.34)		
[65 - 75[	25	2 (8.00)	23 (92.00)		
[75 - 85[	11	3 (27.27)	8 (72.73)		
Sex				0.52	0.47
Male	213	26 (12.21)	187 (87.79)		
Female	161	15 (9.32)	146 (90.68)		
Education				8.91	0.063
No schooling	47	6 (12.77)	41 (87.23)		
Primary	63	5 (7.94)	58 (92.06)		
Secondary	97	9 (9.28)	88 (90.72)		
High school	86	5 (5.81)	81 (94.19)		
University	81	16 (19.75)	65 (80.25)		
Socio-economic level				5.87	0.02
Unfavorable	296	26 (8.78)	270 (91.22)		
Favorable	78	15 (19.23)	63 (80.77)		

- **Acceptance of surgery**

Several factors influenced the acceptance of a neurosurgical procedure. Younger patients (18 - 25 years) had the lowest acceptance (35.19%), while older patients (75 - 85 years) showed the highest acceptance (81.82%). The relation between age and acceptance is statistically significant ($p = 0.013$). Individuals with higher education were more accepting ($p = 0.02$). Patients who believed neurosurgery could result in a cure were more willing ($p = 0.04$). Those who understood their diagnosis accepted surgery more frequently (66.22%) than those who did not (46.31%) ($p = 0.002$).

- **Choice of operator**

A preference for the type of surgeon was associated with educational level ($p = 0.047$). University-educated patients were more likely to prefer being operated on by a professor of neurosurgery. Age, sex, and understanding of diagnosis showed no significant influence.

- **Belief in recovery**

Belief in a favorable outcome after neurosurgery was associated with age ($p = 0.02$). Younger patients were more optimistic about recovery.

- **Knowledge of neurosurgery**

The ability to define neurosurgery was strongly associated with educational level ($p = 0.001$). University-level participants were significantly more likely to provide an accurate definition compared to those with no schooling or only primary education.

- **Awareness of neurosurgical services in Togo**

Awareness of the existence of neurosurgery in Togo was also significantly associated with educational level ($p < 0.001$). Higher education was correlated with greater knowledge of service availability.

4. Discussion

This study presents the first systematic assessment of patients' attitudes toward neurosurgery in Togo, providing insights from a large cohort at the country's main referral hospital. By identifying key determinants such as education and socio-economic status, this study contributes new evidence to the global neurosurgery literature, particularly from francophone West Africa, where data are scarce.

4.1. Knowledge of Neurosurgery

Two hundred ninety-two participants (78.08%) were unable to define neurosurgery or were unaware of its existence in Togo ($n = 254$; 67.91%). Ikwuegbuenyi *et al.* [6] reported in a cross-sectional survey conducted across 16 African countries that 76.3% of respondents provided a complete definition of neurosurgery. In our study, knowledge was strongly linked to educational attainment, with university-educated patients being significantly more informed. This knowledge gap represents a significant barrier to the utilization of neurosurgical care. Targeted awareness campaigns, particularly among populations with limited or no formal education, are necessary to enhance understanding of the specialty. A cross-sectional survey conducted across 16 African countries reveals that while a basic knowledge of neurosurgery may be high, barriers such as rural residence, perceiving care as expensive, and a lack of awareness of local services significantly reduce the willingness to use in-country care [6].

The striking contrast between the low knowledge level reported in the multi-country African Survey [6] may be explained by several factors. First, the Togolese cohort was hospital-based and included a large proportion of patients with limited or no formal education. In contrast, the multi-country survey likely sampled more

literate and urban populations with internet access [6].

4.2. Perception of Treatment Cost

The perceptions of LMIC patients toward neurosurgery are strongly influenced by socioeconomic status [10]-[12]. In our study, 333 participants (89.04%) perceived neurosurgery as expensive, a finding strongly associated with unfavorable socio-economic status. This perception reflects the lack of universal health coverage and the prevalence of out-of-pocket payments in Togo, which serve as significant barriers to access. Similar concerns have been reported by Ikwuegbuenyi *et al.* in a cross-sectional survey across 16 African countries, where high surgical costs discourage timely care-seeking [6]. The socioeconomic determinants of health are amenable to targeted individual and communal interventions [2] [13]. Expanding financial protection mechanisms could therefore reduce inequities in access to neurosurgical services.

4.3. Acceptance of Surgery

Only 58.3% of patients indicated that they would accept surgery if medically indicated. Acceptance was influenced by educational level, belief in the possibility of recovery, and understanding of the diagnosis. Patients who understood their condition were significantly more willing to undergo surgery, highlighting the central role of physician-patient communication [2]. This result underscores the importance of health education and counseling in promoting adherence to neurosurgical treatment. Although this study primarily assessed patients' attitudes and intentions rather than direct behaviors, these findings are closely tied to HSB. Attitudes such as mistrust of local neurosurgeons, perceived high costs, and preference for care abroad are likely to shape actual care-seeking patterns. Framing these attitudes within the broader concept of HSB enhances the interpretation of our results, as patient willingness to undergo surgery or seek treatment abroad represents a critical step in the healthcare-seeking pathway.

4.4. Belief in Recovery

Belief in recovery is influenced by health literacy and cultural expectations of outcomes [2] [10]. Our results demonstrated that less than one-third of participants associated neurosurgery with a cure, while nearly 38% feared disability. Belief in recovery was significantly associated with age, with younger patients being more optimistic. In Ethiopia [10], patients admitted that their religion played a critical role in their attitude toward neurosurgical procedures. These findings suggest that sociocultural factors continue to influence expectations, underscoring the need for culturally sensitive awareness campaigns to address misconceptions and restore confidence in neurosurgical outcomes.

4.5. Choice of Operator

134 patients (61.47%) who accepted surgery preferred to be operated on by a pro-

fessor of neurosurgery rather than a doctor. In the Togolese medical system, the title “professor of neurosurgery” generally refers to a senior academic neurosurgeon who holds a university faculty appointment in addition to clinical responsibilities. In contrast, a “doctor of neurosurgery” designates a qualified neurosurgeon without such an academic title. This distinction carries symbolic authority and prestige, which may explain patients’ stronger preference for professors.

The educational level was the primary determinant of this preference. This reflects both the symbolic authority of academic titles and patients’ need for reassurance about the competence of their surgeon [2] [10]. Non-African patients prefer older and professionally dressed neurosurgeons [2] [14]. In South Korea, Mun *et al.* [15] reported that patients preferred their neurosurgeons to wear name tags and neurosurgery professors to be tidy and formally dressed. Strengthening public confidence in all categories of trained neurosurgeons is crucial to enhancing the acceptance of care.

4.6. Awareness of Neurosurgical Services in Togo

Two-thirds of respondents stated that they would prefer to seek care abroad, mainly due to perceptions of better infrastructure. Awareness of the existence of local neurosurgical services was limited and was more prevalent among individuals with higher educational levels. This tendency toward medical migration reflects both a lack of confidence in national health facilities and insufficient visibility of neurosurgical services in Togo. In their systematic review, Ikwuegbuenyi *et al.* [6] found that a significant proportion of respondents were unwilling to use neurosurgical services in their countries because they did not trust the skill level of their neurosurgeons or the local infrastructure. Respondents were more likely not to trust their neurosurgeons if they regularly collaborated with foreign neurosurgeons, had trained abroad, or were recommended by an acquaintance [6]. Strengthening infrastructure, improving communication on available services, and highlighting local expertise could help reduce this outflow.

Taken together, these findings demonstrate that patients’ attitudes toward neurosurgery in Togo are shaped not only by structural barriers such as cost and infrastructure but also by socio-demographic and cultural determinants, including education and health literacy [16]. Addressing these determinants through targeted education, improved physician-patient communication, financial protection, and investment in local facilities is crucial to fostering more positive attitudes and enhancing access to neurosurgical care [17]. Additional efforts must also be directed toward making neurosurgery a more attractive career option in Togo, as suggested by Doléagbéno *et al.* [18].

5. Limitations

Some limitations must be acknowledged. As a single-center, cross-sectional survey, the findings may not be generalizable to rural or non-hospitalized populations, and causality cannot be inferred. Face-to-face interviews may have intro-

duced social desirability bias. Interviews were conducted in French, with interpretation provided into local languages as needed. Variations in vocabulary and cultural framing across languages could have influenced patient understanding of neurosurgical concepts.

Additionally, the absence of qualitative methods and the limited availability of comparable regional data limit the depth of interpretation. Despite these limitations, the study highlights critical barriers and opportunities to improve access to neurosurgical care in low-resource settings.

6. Conclusion

This study highlights key determinants of patients' attitudes toward neurosurgery in Togo. Perceptions of high cost, limited knowledge of the specialty, and lack of confidence in local services emerged as significant barriers. At the same time, education, belief in recovery, and understanding of diagnosis favored acceptance of surgery. Addressing these factors through financial protection, improved communication, awareness campaigns, and investment in local infrastructure is crucial to strengthening trust in neurosurgical care and reducing reliance on treatment abroad.

Authors' Contributions

A.K. Doléagbénu conceived the study, performed data collection, analysis, and interpretation, and drafted and revised the manuscript. L. Béli, A.K. Békéti, and E. Kpélao reviewed the manuscript. All authors have read and approved the final manuscript.

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Consent to Publish

Consent was obtained from all the authors to publish the study results.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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