

Research Article

# Knowledge and Practice About Traumatic Brain Injury in the Hospital Environment in the DRC

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## Abstract

**Introduction:** Traumatic brain injury (TBI) is a common reason for admission in our setting. It is the cause of primary brain lesions, representing a major public health problem since they are responsible for significant morbidity and mortality. **Materials and Methods:** Observational study with survey, run from December 1, 2023, to January 31, 2024, involving 256 health workers to verify the level of knowledge about traumatic brain injury. **Results:** The age group between 21 and 40 years constitutes 64.05% of cases (n=164), The average age is 29.38, with extremes between 24 and 65 years, We note a male predominance in 53.12% of cases (n= 136), Medical Doctors constitute 75% of the medical personnel interviewed (n=192), we note a clear predominance of 0 to 5 years old with 33.59% of cases (n=86), The faculty predominates as the place of learning about head injuries in 53.65% of cases (n=132), The neurosurgeon takes care of the management of craniocerebral trauma in 58.13% of cases (n=143), According to this staff, the biggest problem in the management of head trauma in our environment is the cost of treatment with 62.89% of cases (n=161) and in most cases (54.29% of cases or 139 patients), health personnel consider themselves to have a mean level of understanding of craniocerebral trauma. **Conclusion:** The management of TBI is currently a diagnostic, therapeutic, and prognostic challenge linked to several factors in our environment. A consensual approach standardized to adapt to our practical reality proves helpful in reducing morbidity and mortality.

## Keywords

Knowledge, Practice, Traumatic Brain Injury, RDC

## 1. Introduction

Traumatic brain injury (TBI) is a common reason for admission in many emergencies. It is the cause of primary brain lesions, representing a major public health problem since they are responsible for significant morbidity and mortality. The annual incidence of head trauma in France is 155,000 cases,

generating around 8,000 yearly deaths and around 4000 comas. Approximately 4% of these patients die immediately on sites of trauma, and 9% have severe TBI assessed by a Glasgow score strictly lower than 9. If it is difficult to intervene on the initial severity of the cerebral lesions, medical

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care, particularly in the first hours, significantly influences the occurrence and prevention of secondary brain lesions [8].

The object of this study is to verify the level of knowledge about traumatic brain injury in our environment.

## 2. Materials and Methods

Observational study with survey, runs from December 1, 2023, to January 31, 2024, i.e. two months, involving 256 health workers.

Inclusion criteria: health worker (Medical Doctor or nurse) in several hospitals in the city of Lubumbashi (university clinic, Janson Sendwe General Hospital, Hakika General Hospital, Diamant Clinic, National train direction society's hospital, Kitumaini Polyclinic, military hospital of Rwashi, Medpark Clinic), all departments (Surgery, Intensive Care Unit, Gynecology, Pediatrics, Internal Medicine, Neuropsychiatry, Emergency, General Medicine, Neurosurgery, Physiotherapy, Stomatology).

Exclusion criteria: other paramedical staff, administrative staff, and interns.

Study parameters: Age, sex, qualification, seniority, attitude, and practice of cranioencephalic trauma in a hospital setting.

Data collection was done using a pre-established written questionnaire that was previously tested to detect possible flaws. Data were encoded using Microsoft Word 2010 and Excel 2016 software. Data analysis was done using Epi info 7.2.5.0 software.

## 3. Results

### 3.1. Age

The age group between 21 and 40 years constitutes 64.05% of cases (n=164), with a clear predominance of the age group between 31-40 years in 40.23% of cases (n=103). Staff aged 41 and 50 constitute 14.06% of cases (n=36). The average age is 29.38, with extremes between 24 and 65 years as illustrated in table 1.

**Table 1.** Distribution of patients according to Age.

Age (years)	Number	Percentage
21 – 30	61	23.82
31 – 40	103	40.23
41 – 50	36	14.06
> 50	20	7.81
Undetermined	37	14.45
Total	256	100

### 3.2. Sex

The male predominance in 53.12% of cases (n= 136) compared to 39.06% of cases for females with a ratio of 3/1 as illustrated in table 2.

**Table 2.** Distribution of patients according to sex.

Sex	Number	Percentage
Male	136	53.12
Female	100	39.06
Undetermined	21	8.20
Total	256	100

### 3.3. Qualification

Medical Doctors constitute 75% of the medical personnel interviewed (n=192), with a clear predominance of general practitioners in 48.82% of cases (n=125). Nurses, for their part, constitute 25% of cases (n=64), with a predominance of A1 nurses in 12.5% of cases (n=32).

All the repartition according to the qualification is illustrated in table 3.

**Table 3.** Distribution of patients according to qualifications of health worker.

Health Worker	Qualification	Number	Percentage
Medical Doctor	Generalist	125	48.82
	Specialist	60	23.43
	Associate professor	7	2.73
	Teacher	-	
	Full professor	-	
	Total	192	75
Nurse	A1	32	12.5
	A2	15	5.85
	Undetermined	17	6.64
	Total	64	25
Total		256	100

### 3.4. Seniority

In this study, a clear predominance of 0 to 5 years old with 33.59% of cases (n=86), followed by the age group between 6-10 years old with 30.46% of cases (n=78). In 64.05% of cases (n=164), the medical staff has at most ten years of

medical practice as illustrated in [table 4](#).

**Table 4.** Distribution of patients according to Seniority of worker.

Duration	EFFECTIVE	PERCENTAGE
0 – 5 years	86	33.59
6 – 10 years	78	30.46
11 – 20 years	50	19.53
Greater than 20 years	22	8.59
Undetermined	30	11.71
Total	256	100

### 3.5. The Source of Knowledge of the Concept of TBI

This study reveals that the medical staff interviewed have variable knowledge about TBI. The faculty predominates as the place of learning about head injuries in 53.65% of cases (n=132), followed by the hospital with 48.82% of cases (n=125). Conferences and television constitute 20.3% of cases (n=52), the [table 5](#) illustrated that.

**Table 5.** Distribution of patients according to source of Knowledge about TBI.

Source of Knowledge about TBI	Number	Percentage
Faculty	132	51.56
Television	11	4.29
Hospital	125	48.82
Conference	41	16.01
Undetermined	43	16.79

### 3.6. Number of Patients Received for TBI

It appears in this study that in 96.34% of cases, the medical staff interviewed have already received or treated a cranio-cerebral trauma patient with a predominance in the range of 1 to 10 patients with 48.04% of cases (n= 123) against a sig-

nificant equal proportion of the group of at least ten patients received with 48.04% of cases (n= 123), as illustrated in [table 6](#).

**Table 6.** Distribution of patients according to number of TBI.

Number of patients	Number	Percentage
1 – 10	123	48.04
11 – 20	46	17.96
> 21	77	30.07
Undetermined	9	3.51
Total	256	100

### 3.7. Knowledge of the Concept of Severe Head Trauma

This study reveals that in 92.18% of cases (n=236), the medical personnel interviewed know about severe head trauma compared to 5.07% of cases (n=13) who do not know the concept of severe head trauma.

**Table 7.** Distribution of patients according to Knowledge of the concept of severe head trauma.

Answer	Number	Percentage
Yes	236	92.18
No	13	5.07
Undetermined	6	2.34
Total	256	100

### 3.8. Knowledge of the Concept of Intracranial Hypertension

If, in 93.49% of cases (n=230), the medical staff claim to know the concept of intracranial hypertension, this nevertheless contrasts with the 92.67% of cases of the medical staff observing who have either poorly defined (25.39 % of cases; n=62) or which have not been defined at all (66.40% of cases; n=170).

**Table 8.** Distribution of patients according to Knowledge of intracranial hypertension.

Answer	Number	Percentage	Exactitude of answer	Number	Percentage
Yes	233	91.01	True	21	8.20
No	14	5.46	False	65	25.39

Answer	Number	Percentage	Exactitude of answer	Number	Percentage
Undetermined	9	3.51	No definition	170	66.40
Total	256	100	Total	256	100

### 3.9. First-line Examination in TBI

Brain CT is the first-line imaging test in managing crani-encephalic trauma in 69.53% of cases (n = 178), followed by brain MRI in 11.71% (n = 30). In 30.06% of cases (n = 70), the health personnel interviewed ignored the first-line diagnostic examination in the TCE.

**Table 9.** Distribution of patients according to First-line examination in TBI.

Type	Number	Percentage
Brain CT	178	69.53
Brain MRI	30	11.71
Standard x-ray	23	8.98
Undetermined	24	9.37
Total	256	100

### 3.10. Management and Problem of Care of TBI in Our Environment

The neurosurgeon takes care of the management of craniocerebral trauma in 58.13% of cases (n=143), according to the medical staff interviewed, followed in 34.14% of cases (n=84) by a multi-faceted approach. Disciplinary, followed by the resuscitator in 17.47% of cases (n=43).

**Table 10.** Distribution of patients according to management of head trauma.

Management of head trauma	Number	Percentage
Neurosurgeon	143	58.13
Resuscitator	43	17.47
Physiotherapist	3	1.21
Any doctor	9	3.65
Multidisciplinary	84	34.14
Undetermined	3	1.21

In approximately 50% of cases (n=128), the management of crani-encephalic trauma is satisfactory according to the medical staff interviewed, compared to a significant proportion of staff believing that the management is unsatisfactory in 40.62% of cases (n=104).

**Table 11.** Distribution of patients according to the quality of management of head trauma.

Satisfied	Number	Percentage
Yes	128	50
No	104	40.62
Undetermined	24	9.37
Total	256	100

According to this staff, the biggest problem in the management of head trauma in our environment is the cost of treatment with 62.89% of cases (n=161), followed by the insufficiency of the technical platform with 45.70% of cases. Cases (n= 117). The quality of medical staff and misinformation constitute 33.59% of cases (n=86).

**Table 12.** Distribution of patients according to the problem of care of TBI.

Challenge	Number	Percentage
Cost of treatment	161	62.89
Qualification of medical staff	61	23.82
Under equipment	117	45.70
Disinformation	25	9.76
Hospital organization	26	10.15
Undetermined	3	1.17

According to the level of knowledge, in most cases (54.29% of cases or 139 patients), health personnel consider themselves to have a mean level of understanding of craniocerebral trauma, followed by high and low levels of knowledge, re-

spectively 16–79% of cases (n=43) and 12.5% of cases (n=32).

**Table 13.** Distribution of patients according to Knowledge of the severity of TBI.

Level of knowledge	Number	Percentage
High	43	16.79
Mean	139	54.29
Low	32	12.5
Difficult to classify	43	16.79
TOTAL	256	100

## 4. Discussion

Traumatic brain injury (TBI) remains a significant source of death and permanent disability, contributing to nearly one-third of all injury-related deaths in the United States and exacting a profound personal and economic toll. Despite the increased resources that have recently been brought to bear to improve our understanding of TBI, the development of new diagnostic and therapeutic approaches has been disappointingly slow. [1].

All actors in the care chain are concerned and play a vital role. From the scene of the accident through the emergency room to intensive care if severe TBI, medical and surgical care is essential [2]. The first-line imaging test is brain CT [3-5]. The care is multidisciplinary (Neurosurgeon, emergency physician, neurologist, psychologist, physiotherapist, resuscitator, etc.) [5].

Although training significantly provides quality services, the adequate or minimum technical platform (especially in low-income countries) is an emergency in Neurosurgical practice.

In DRC, several problems characterize the health system, including:

- 1) Problems with the provision of health services and care: Low health coverage, low quality of services and care offered, Low use of available services, low resilience of health structures in the face of possible epidemics, emergencies, and disasters, and low public accountability of Health Services to the community [6].
- 2) Infrastructure and equipment problems: Deficit of health structures built and equipped by standards and low capacity of the sector to ensure maintenance of acquired infrastructure and equipment [6].
- 3) Problems of human resources for health: Imbalance in production and the inequitable distribution of HRH, low motivation and loyalty of health personnel, Insufficient education for health professionals, and low development skills of health personnel [6].

- 4) Problems related to medicines, vaccines, contraceptives, and specific inputs: Low availability of drugs, vaccines, contraceptives, and particular inputs in health facilities, Persistent circulation of poor-quality medicines [6].
- 5) Health financing problems: Low allocation of public resources to the health sector, insufficient risk sharing and financing mechanisms health, fragmentation of official development assistance, inefficiency, and weak application of financial management procedures [6].
- 6) Health information problems: Disintegration of the different components of the SNIS, low completeness, timeliness, and correctness of the data collected, and low dissemination of quality information [6].

This national health context generally affects all service areas and neurosurgical practice. In our study, the biggest problem in managing TBI in our environment is the cost of treatment, with 62.89% of cases (n=161), followed by the insufficiency of equipment with 45.70% of cases. Cases (n=117). The qualification of medical staff and misinformation also constitute 33.59% of cases (n=86).

As a result, training medical personnel becomes an essential element of good management of neurosurgical pathologies in our environment, thus reconciling efficiency and accessibility. In our environment, the quality of medical staff and misinformation constitute 34.95% of cases (n=86).

Overall, in Africa sub-Saharan Africa, the proportion of doctors in the population is 18 per 100,000 medical schools in sub-Saharan Africa 71 compared to those of countries like India (60 per 100,000), Brazil (170 per 100,000), and France (370 per 100,000). The poorest people face even more significant shortages [7].

Several recommendations to advance and improve medical education and population health in sub-Saharan Africa were formulated as follows:

- 1) Launch campaigns to develop the capacity of medical school faculty, including recruitment and retention [7];
- 2) Increase investment in medical education infrastructure; establish structures that will promote inter-ministerial collaboration for medical education [7, 8];
- 3) Fund research and research training in medical schools [7, 8];
- 4) Develop community-oriented education based on primary health care principles [7];
- 5) Establish postgraduate medical education programs at the regional and national levels to stimulate training, excellence, and loyalty [7];
- 6) Establish national and regional bodies responsible for accreditation and quality assurance medical education [7];
- 7) Increase investment by funders in medical education while remaining aligned with national health needs [7];
- 8) Recognize and review the growing role of private institutions in medical education [7];
- 9) Revitalize the Association of African Medical Schools [7, 8].

Central African countries' educational systems are generally highly dependent on those of Westerners. Their realities, however, are very different. This is why the specialization of African executives in European universities has always been the subject of intense criticism. He is often criticized for hiding the socio-economic and cultural realities in which these executives evolve and, therefore, being unsuitable for the specific needs of those countries. The techniques and technologies taught in the developed, wealthy countries do not constantly adapt to the conditions of developing, poor countries. In addition, the number of African executives we can train by sending them abroad cannot cover the enormous needs of forming these countries [9, 10].

## 5. Conclusion

The management of TBI is currently a diagnostic, therapeutic, and prognostic challenge linked to several factors in our environment. The supervision of medical personnel in Lubumbashi, in particular and in the DRC in general, mainly composed of young people, is urgent to reduce TBI-related morbidity and mortality. A consensual approach standardized to adapt to our practical reality proves helpful in reducing morbidity and mortality.

## Abbreviations

TBI Traumatic Brain Injury

## Conflicts of Interest

All authors declared no conflicts of interest for this study.

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