

Research Article

Quality of Referrals of Surgical Emergencies Admitted to the Departmental Teaching Hospital Borgou-Alibori (CHUD BA) in 2021 and Explained Factors

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Abstract

To be of good quality, the references must comply with the various standards established by the Ministry of Health. The objective of this study was to analyze the quality of surgical referrals admitted to the Borgou Alibori Departmental University Hospital Center (CHUD B/A) in 2021 and their explanatory factors. The study concerns all patients referred to health facilities in the Borgou department and admitted to the CHUD-B /A during the period from April 1 to June 30, 2021. This was a cross-sectional observational study with an analytical aim. The dependent variable was the quality of the reference; the independent variables were individual, contextual and organizational. The data collection was hybrid (interview with the patients, after obtaining written consent followed by a recount of the reference sheets). The data was analyzed using the SPSS 21.0 software. A binary logistic regression model was adjusted to identify the factors associated with the poor quality of the reference; the significance level was 0.05. Out of a total of 81 references included, only 16.0% of them were of good quality. The age ($p = 0.049$), as well as the local level of the patient's original health facility in the health pyramid ($p < .001$) were the factors associated with the quality of the reference. Most of the emergency surgical referrals admitted to CHUD B/A in 2021 were not of good quality. It is important to review the organization of the reference and counter-reference system to make it operational and guarantee its effectiveness.

Keywords

Quality of the Reference, Surgical Emergencies, Age, Source of Care Financing, Health Pyramid, Health System Organization, Borgou, Benin

1. Introduction

Nowadays, a patient, for a given health problem, is taken care of and treated at different levels of the health system depending on the severity of his condition and the level of equipment of health facilities. This mechanism, possibly by the organization of the health system, is the reference and counter-reference system (RCR). The reference is the mech-

anism by which a health facility (HF) directs a case that exceeds its competencies to a more specialized and / or better equipped institution [1]. There have been national guidelines in Benin since 2018 that govern the organization of the reference and counter-reference system [1]. The Departmental University Hospital Center of Borgou / Alibori (CHUD B/A)

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is located at the intermediate level of the health pyramid which includes three levels (peripheral, intermediate and central) [2]. Its emergency reception department receives at least one patient with a surgical condition every day [2] and referred in a sometimes vital emergency situation from peripheral health facilities. The ideal would be that, in accordance with the guidelines, each actor of the system (patients and accompanying people, health workers, political and administrative authorities) knows, controls and plays his role during these referrals for optimal patient care. In daily practice, the CPR device remains poorly operational. Indeed, many malfunctions are noted (referred patients who do not arrive due to lack of means, referrals without a reference sheet or without medical accompaniment, transportation of referred patients by impractical means, absence of counter-referral from the hospital) [3]. This situation is at the origin of negative impacts on health (lack of traceability of care and delay in the management of the patient worsening of the vital or functional prognosis) and socio-economic (increase in individual and collective health expenses, loss of public confidence in the system. Faced with this, the actions carried out are mainly oriented towards references to obstetric emergencies which are struggling to be properly improved so that their positive repercussions on surgical emergencies are barely perceptible. All this raises many concerns: do the actors in this system know their roles? Why is there a delay in certain references (the determinants)? Are the different levels of care communicating as they should be in relation to the patients' case? What concrete actions can be taken to address the shortcomings of the system? The answer to these concerns motivates this work, the main objective of which was to study the quality of the surgical references admitted to the CHUD B/A in 2021 and their explanatory factors.

2. Setting, Material and Method

This was a cross-sectional observational study with an analytical aim. The framework of the study is the emergency reception unit of the CHUD B/A. The study population was represented by patients referred to surgical emergency from peripheral health facilities in the Borgou department. The minimum sample size was estimated at 80 patients according to the Schwartz formula. The recruitment was exhaustive and concerned the entire population of patients verifying the inclusion criteria and admitted during the period from April 1 to June 30, 2021. The dependent variable was the quality of the reference and was defined as a composite indicator measured on the basis of 13 elements of a good reference that are the justified nature of the reference, the speed of the decision to refer, the opinion of the patient or his companions on the reference, the telephone call from the emergency switchboard of the CHUD B / A by the agent who refers, the conditioning of the patient (venous first aid and first aid), the transport provided by an ambulance, the signature of the travel book by the referring agent, the admission with the link sheet (of

which the part of the reference is filled in and the part of the counter-reference sent to the CHUD B/A), the accompaniment of the referred patient by a health worker, the call to ensure the patient's destination at the CHUD B / A. Each step respected for a reference assigns it a grade of 1, the grade 0 otherwise. The independent variables were of three (03) orders, namely: the socio-demographic characteristics of the referred patients, their physical environment and the organization of the health system. The data collection was carried out by a hybrid technique based on a documentary analysis (counting of the CPR sheets), an observation (of the cases received in the emergency room) and a structured face-to-face individual interview (with the patient (or his companions if necessary) at the CHUD B / A and with the agents of the referring center at the level of their respective data sheets) in order to complete the information of the independent variables using a single collection sheet including all the tools (structured individual interview guide, observation grid and counting sheet). The data were processed and analyzed with the IBM SPSS version 21.0 software. A binary logistic regression model by the step-by-step descending procedure was adjusted to identify the factors associated, in multivariate analysis, with the quality of the reference; the significance threshold of 5%.

The conduct of the study was authorized by the Local Ethics Committee for Biomedical Research (CLERB) of the Faculty of Medicine of the University of Parakou under reference 0423/CLERB-UP/P/SP/R/SA on 19/06/2021. The written informed consent of each of the participants or of a close relative and recorded on an initially pre-established sheet was obtained after information on the study, its benefits and risks, participation and voluntary withdrawal, anonymity and confidentiality of the information to be collected.

3. Results

3.1. Descriptive Aspects

3.1.1. Characteristics of Referred Patients

A total of 92 patients referred to surgical emergency who met the inclusion criteria were registered during the study period: 81 were included, i.e. a recruitment rate of 88.0%. These patients, aged in relative majority from 20 to 40 years and illiterate (44.4%), were mainly men (86.4%) with a monthly income of less than 50,000 FCFA (i.e. €76.3) without any mutual health insurance (97.5%); they have never been referred to the CHUD BA (76.5%) and relied on their ancestors to finance health care (43.2%), culturally, they are mostly Muslims (66.7%), perceived the disease as serious (95.1%) but of natural origin (96.3%). Clinically, most cases concerned traumatic emergencies (82.7%), with a sudden onset (95.1%) belonging to a surgical specialty (55.6%). Table 1 shows the individual characteristics of the patients as well as the reference quality.

Table 1. Individual characteristics and referral quality of patients to Department and teaching hospital of Borgou Alibori, Parakou, Benin 2021 (n=81).

	Frequency	
	Absolute	Relative (%)
Age group (years)		
- <20	26	32.1
- 20 to <40	36	44.4
- 40 and more	19	23.5
Level of education		
- Illiterate	36	44.4
- Literate child or primary level	26	32.1
- Secondary education or more	19	23.5
Mutual for health insurance availability		
- No	79	97.5
- Yes	2	2.5
Source of health care financing		
- Others (friends, outside helpers)	26	32.1
- Ascending parents (father or mother)	35	43.2
- Collateral relatives	20	24.7
Healthcare cost assessment		
- Affordable	56	69.1
- Expensive	25	30.9
Former referral to Departemental Teaching Hospital Borgou ALibori		
- No	62	76.5
- Yes	19	23.5
Emergency type		
- Traumatic	67	82.7
- Not traumatic	14	17.3
Beginning type		
- Brutal	77	95.1
- Progressive	4	4.9
Clinical speciality		
- General surgery	21	25.9
- Special surgery	45	55.6
- Special and general surgery	15	18.5
Referral quality		
- Good	78	84.0
- Fair	13	16.0

3.1.2. The Contextual and Organizational Characteristics

These patients mainly came from public health institutions (56.8%) in the Parakou-Ndali health district (49.4%) at the local level of the health pyramid (39.8%) where the condition of the course is considered good (66.7%) and where the quality of care anticipated by the patient was considered acceptable in 48.2% of cases. There is neither a functional ambulance (69.1%) nor material resources in hand (95.1%). The referred staff were often physicians (85.2%), without any reference training (95.1%) with less than two years of professional experience (64.2%). Table 2 presents the contextual and organizational variables.

Table 2. Contextual and organizational characteristics of patients' referral to Departmental and teaching hospital of Borgou Alibori, Parakou 2021 (n=81).

	Frequency	
	Absolute	Relative (%)
Referral municipality		
- Bembèrè	18	22.2
- Kalalé	0	0.0
- Parakou	23	28.4
- Pèrè	1	1.2
- Ndali	17	21.0
- Nikki	2	2.5
- Sinendé	0	0.0
- Tchaourou	20	24.7
Referral health district		
- Bembèrè-Sinendé	18	22.2
- Nikki Kalalé-Pèrè	3	3.7
- Parakou Ndali	40	49.4
- Tchaourou	20	24.7
Health facility type		
- Public	46	56.8
- Private	35	43.2
Level of HF in the health pyramid		
- Peripheral HF	25	30.9
- Local hospital	50	61.8
- Regional hospital	6	7.3
Availability of an ambulance functional		
- No	56	69.1

	Frequency	
	Absolute	Relative (%)
- Yes	25	30.9
Means of transport		
- Ambulance	32	39.5
- Taxi or personal car	29	35.8
- By motorcycle or others	20	24.7
Health care quality assessment		
- Bad	21	25.9
- Fair	39	48.2
- High	21	25.9
Referent staff qualification		
- Physician	69	85.2
- Paramedical staff	12	14.8
Referral staff training		
- nothing	77	95.1
- Yes	4	4.9
Referral staff seniority (years)		
- ≥ 2	29	35.8
- < 2	52	64.2

3.1.3. The Quality of the Reference

All surgical emergencies referred to CHUD B/A for which the reasons were specified were justified, but only 16.0% were of good quality. The different stages of a good reference have not always been respected. The modalities of the quality of the reference which were often in question were: the referral decision often taken late (75.3%), the absence of a

telephone call from the BA CHUD to announce the case to the reference (69.1%), the non-medical transport of patients (61.7%), the absence of signature of the logbook of the references by the paramedics or the referring agents (48.5%), the absence of accompaniment of the patient to the CHUD B / A by a health worker (56.9%), the absence of accompaniment from the patient to the CHUD B/A by a health worker (56.9%), the non-sending (30.9%) and the insufficient filling (91.4%) of the patient's reference sheet, the non-sending of the section against reference of the reference sheet to the CHUD B / A (21.0%), the absence of a call from the CHUD B / A to ensure the correct destination of the referred patient (72.8%).

3.2. Associated Factors

In univariate and multivariate analysis, age ($p=0.049$), as well as the level of the patient's health facility in the health pyramid ($p<0.001$) were the factors associated with the quality of the reference. Indeed, compared to patients under the age of 20, those aged 20 to under the age of 40 were 0.14 times more likely to have had a bad reference (i.e. 7.14 times the chances of a good reference quality) and this in a statistically significant way ($PR=0.14$ 95% $CI=0.02 - 0.99$). Similarly, compared to peripheral health units (village health units), the data sheets at the local level (isolated D or M; CSA and CSC) had 0.01 times more chances of poor reference quality (100 times more chances of good reference quality and this in a statistically significant way ($PR=0.01$; 95% $CI=0.001-0.12$).

To a lesser extent and in univariate analysis when the source of care financing consists of collateral relatives, compared to friends and acquaintances, there is 0.22 times more risk of poor reference quality (i.e. 4.5 times more chance of good reference quality) statistically significantly ($PR=0.22$ 95% $CI=0.07-0.66$; $p=0.007$).

The other individual, contextual and factors were not associated with the quality of the reference. Table 3 presents these results.

Table 3. Associated factors to referral quality of patients to Departmental and teaching hospital of Borgou Alibori, Parakou, Benin 2021 ($n=81$).

	n_T	Referral quality = bad		Bivariate analysis			Multivariate analysis		
		n_i	%	crude PR	$CI_{95\%}$ PR	p-value	Adj-PR	$CI_{95\%}$ PR	p-value
Age group (years)									
< 20	26	21	80.8	1			1		
20 - < 40	36	21	58.3	0.33	0.10 - 1.08	0.068*	0.14	0.02 - 0.99	0.049**
≥ 40	19	11	57.9	0.33	0.09- 1.24	0.101	0.69	0.07 - 6.80	0.750
Gender									
Female	11	7	63.6	1			1		
Male	70	46	65.7	0.91	0.24 - 3.43	0.893	0.42	0.05 - 3.79	0.440

	n _T	Referral quality = bad		Bivariate analysis			Multivariate analysis		
		n _i	%	crude PR	CI _{95%} PR	p-value	Adj-PR	CI _{95%} PR	p-value
Level of education									
Illeterate	36	21	58.3	1					
Literate or primary	26	18	69.2	1.61	0.55 - 4.66	0.382			
Secondary or more	19	14	73.7	2.00	0.59 - 6.76	0.264			
Religion									
Islam	57	37	64.9	1			1		
Autres religions	27	16	59.3	0.67	0.26 - 1.74	0.410	0.289	0.07 - 1.25	0.097*
Financing sources									
Others (friends, foreign aids)	26	11	42.3	1			1		
Ascendants parents (father or mother)	35	27	77.1	0.89	0.25 - 3.21	0.857	1.42	0.22 - 9.02	0.711
Collateral Parents	20	15	75.0	0.22	0.07 - 0.66	0.007**	0.20	0.03 - 1.46	0.113
Mutual Health Insurance									
No	79	52	65.8	1			1		
Yes	2	1	50.0	0.52	0.03 - 8.63	0.648	0.08	0.00 – 37.2	0.418
Former referral to Departmental Hospital									
No	62	39	62.9				1		
Yes	19	14	73.7	1.6	0.63 - 5.18	0.390	2.27	0.40 - 12.83	0.354
Level of Health Facility in the health pyramid									
Peripheric HF	25	23	92.0	1			1		
Local hospital	50	25	50.0	0.09	0.02 - 0.41	0.002	0.01	0.001 - 0.12	< 0.001
Regional hospital	6	5	83.3	0.44	0.03 - 5.78	0.528	0.12	0.004 - 3.83	0.233
Health Facility Type									
Public	46	31	67.4	1			1		
Private	35	22	62.9	0.82	0.33 - 2.06	0.671	0.39	0.09 - 1.69	0.209
Heath care quality assessment									
Bad	21	13	61.9	1			1		
Fair	39	24	61.5	0.99	0.33 - 2.93	0.978	0.35	0.06 - 2.03	0.241
High	21	16	76.2	1.97	0.52 - 7.49	0.320	0.47	0.07 - 3.08	0.431
Referent staff qualification									
Physician	69	46	66.7	1			1		
Paramedical staff	12	7	58.3	0.70	0.20 - 2.45	0.577	0.163	0.02 - 1.74	0.133

Legend: * Significant at p=.1 threshold; ** Significant at p=.05 threshold PR: prevalence ratio Nagelkerke R² = 0.524; Hosner and Lemeshow test: p=.345; Sensibility: 60.7 Specificity: 86.8

4. Discussion

4.1. Strength and Weakness of the Study

This study, which does not intend to be exhaustive, made it possible to take a realistic look at the situation of surgical emergencies, which are the subject of few concerns in our countries. But before approaching the actual discussion, it is important to return to elements that limit the scope of our conclusions. First, the declarative mode of information collection is relatively distant in time and therefore requiring a memorization effort on the part of patients or accompanying persons could induce an information bias. Then, a social desirability bias on the part of the healthcare providers was possible, during the descent into the FS having referred patients for additional information, about the availability of material resources. Thirdly, a selection bias cannot be excluded given that 11 files of the 92 patients referred to the CHUD BA were unusable (12.0%) and that these patients may have shared the same characteristics going in the direction of good or poor reference quality. Finally, the relatively limited size of our sample given the constraints of time and resources did not allow us to have sufficient statistical power to detect all the factors associated with the quality of reference. Despite these limitations, we have obtained results that are not lacking in interest.

Indeed, with 52.4% of the explained variance (Nagelkerke $R^2 = .524$), the model adjusts the data quite well with a sensitivity of 60.7% and a specificity of 86.8%; in addition, the Hosmer and Lemeshow test is not significant ($p=.345$) showing that there is no difference between the proportion of predicted referral quality and that observed.

4.2. Prevalence of the Quality of Reference

It follows from this work that only 84.0% were of poor quality. A similar study carried out by Agonnoudé et al, 2018 [4] in the health districts of Djougou Copargo Quake (DCO) and Kandi Gogounou Ségbana (KGS) on obstetric emergencies, 52.3% of poor quality referrals had been found. The main reason for this difference could be found in the fact that in Benin, as in most African countries, there have been concrete health policies and actions in the field of obstetrics for several decades to improve the quality of management of maternal and child pathologies. This is the example in Benin of the operational plan to reduce maternal and neonatal mortality integrating free caesarean section programs, emergency obstetric and neonatal care interventions (SONU), audits of maternal and neonatal deaths. These actions aim to improve practices for the management of maternal and child condition, including obstetric emergencies. The existence of such actions is very consistent with the numerous studies carried out

in the field of obstetric emergencies [5-9]. All this confirms the observation according to which the references (an integral part of the patient's management) of obstetric emergencies are of better quality than those of surgical emergencies for which, on the one hand, there is currently little scientific data to account for the real situation of the difficulties they suffer from, but above all that there are fewer concrete health actions on the other hand. However, surgical emergencies, in particular traumatic ones, are constantly increasing and are fraught with morbidity both in Borgou and in the rest of Benin.

4.3. Factors Associated with the Poor Quality of Reference

These factors are of an individual and organizational nature. At the end of our study, it is the individual factors, in particular the age of the patients and the organizational factors (the level of the HF in the health pyramid) and to a lesser extent the source of financing of the care which were associated with the quality of the reference.

Patients between the ages of 20 and 40 are often protected from poor reference quality. This observation can be explained by the socio-economic status of the patient who, in full professional activity, is able to take charge of his care and therefore his referral rather than a young person who should rely on these parents to do so.

The influence of the source of care financing on the quality of his referral and more generally on his care is not a surprising fact given the economic level of the individuals in the study. Indeed, for reasons of financial limitation, it is common to see in current practice that patients refuse care or oppose the care or referral process when they do not have a source of funding to rely on. According to Mpirimbanyi et al, 2019 [10] during the transfer to the referral hospital, 5% of the patients were delayed for financial reasons. According to Bodenmann et al at 2012 [11], 10.4% of patients have abandoned their care in the last twelve months for economic reasons. It is interesting to note that this situation is explained by the lack of funding for the RCR device by the public authorities; a referral, especially in an emergency, should not be delayed or poorly executed for economic reasons. In our country, the share of the general state budget allocated to the health sector is still low and declining: it went from 7.6% in 2016 to 5% in 2019; which is still far from the 15% according to the commitments made by the African governments in Abuja in 2001 [12].

From one level of the health pyramid to another, there are discrepancies in the quality of references. Compared to patients referred to village health units (health training led by unqualified health workers), those from communal or district health centers were more likely to have a good quality referral. This observation in connection with the quality of the human resources making the references is expected and joins that of Agonnoudé et al [6], who has found that the municipality of belonging of the patients influences the quality of the reference.

Thus, this significant difference in the quality of the reference according to the age, the source of financing of the care and the geographical location of the patient raises the question of social inequalities in health and health equity and deserves a thorough reflection with a view to an appropriate response if we really want to correct the disparities in access to health for the different social strata and regions of the same country.

According to our analyses, the material resources were not found to be associated with the quality of the reference, contrary to the observations of Susan et al, 2006 [13], who have found that the availability of material resources influences the quality of references in developing countries. This association can be easily understood in the sense that the very execution of the various steps of a good reference requires equipment such as rolling stock (functional ambulance), cardiopulmonary resuscitation sheets, emergency kits to perform first aid as well as conditioning and communication means. It should be noted that for 69.1% of the patients referred, the FS did not have a functional ambulance. Thérèse et al, 2015 [14], found in Bamako that 90% of health centers did not have an ambulance. More than half (56.9%) of the patients were not accompanied by a health worker. This joins the work of Théra et al, 2015 [14], and from Fofana, 2016 [7], who reported in their studies that, respectively, 84.6% and 41% of the patients referred were not accompanied by a health worker. The equipment of the various FS in material and human resources remains a major challenge for the improvement of the RCR device and more generally of the quality of delivery of the health system.

5. Conclusion

At the end of this study, it can be recalled that the surgical emergencies most referred to in the CHUD B/A emergency department were traumatic type neurosurgical emergencies. Referrals to surgical emergencies have a low prevalence of good quality (16%). The most recurrent reasons for this low prevalence are the delay in the referral decision, the absence of prior information from the CHUD B/A, the non-medicalized transport of patients and the incomplete and inadequate filling of the RCR sheets. The factors associated with the quality of the reference were of an individual nature (the age of the patients, the source of financing of the care) and above all organizational (the level of the health establishment in the health pyramid). The RCR system in Benin, especially in terms of referrals for surgical emergencies, suffers from several shortcomings regarding the standards that govern the referral and counter-referral mechanism between the different entities of the Beninese health system.

These studies show that, like obstetric emergencies, it is necessary to direct more actions to the benefit of other categories of emergencies so that the health system can respond appropriately and effectively to the needs of users. A similar study but oriented towards the financing policies and the supervision of the RCR is necessary to locate the responsi-

bilities.

Abbreviations

CHUD BA	Departmental and Teaching Hospital of Borgou and Alibori Departments
CI	Confidence Interval
CLERB	Local Ethics Committee for Biomedical Research
CSA	County Health Facility
CSC	Commune Health Facility
DCO	Djougou Copargo Quake Health District
ENATSE	National School of Public Health and Epidemiology
FCFA	Franc of African Financial Community
HF	Health Facility
KGS	Kandi Gogounou Ségbana Health District
PR	Prevalence Ratio
RCR	Reference and Counter-Reference

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Author Contributions

RA has initiated the subject, written the protocol, collected and analyzed data as part of his Medical Doctorate thesis. MTA has reviewed the protocol, supervise data collect and analyses, written the paper and search references and DSH has supervised all the process.

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Conflicts of Interest

The authors declare no conflicts of interest.

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