

ORIGINAL RESEARCH ARTICLE

FACTORS AFFECTING THE LENGTH OF STAY OF PATIENTS IN THE EMERGENCY DEPARTMENT OF THE DOUALA GENERAL HOSPITAL IN CAMEROON

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OUTLINE

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Problem statement

- The LOS of patients in the ED has been estimated in most European nations and is regularly evaluated and is used to measure of the performance in the ED (*Bukhari,2014*).
- Literatures has limited prospective studies on the LOS (*Karaca et al, 2012*).
- PLOS has been attributed to various internal and external factors (**Bashkin et al, 2015**).
- PLOS may lead to patients dissatisfaction, walkouts, and the potential for compromised medical care (*Robert & Stephen,2004*).
- LOS has not been estimated in DGH and it influencing factors.

Justification of study

- Original study in the DGH.
- Indicator for measuring performance in ED.
- Limited prospective study on LOS in the ED

Objectives

1. To estimate LOS of patients at the ED in the DGH.
2. To identify the core factors that affects the LOS of patients at the ED in the DGH.

MATERIALS AND METHODS

Study design : Clinical setting cross sectional study.

Study area/site : ED in the DGH(Referral, created in 1987, 320 beds, mission, standard ED, about 500 patients visit per month, 6000/yr).

Data collection instrument: Questionnaire & Observation sheet

Data flow

- # of questionnaires **administered=210**
- # of questionnaires **rejected =04(1.90%)**
- # of questionnaires **validated for=206(98.10%)**

Process of data collection

- Observation of all ED patients flow.
- Observing time of arrival and departure.

Ethical considerations

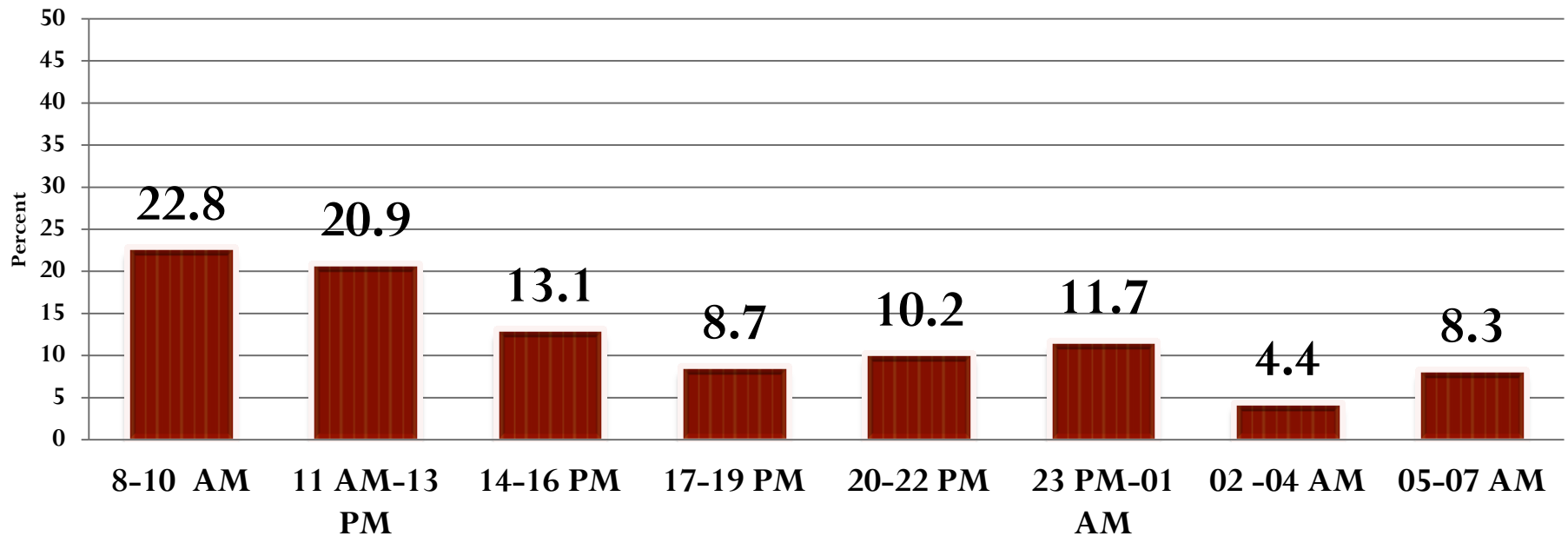
- Administrative authorisation from the DGH
- Information sheet and consent to participants

Data entry: EpiData 3.1

Analysis: SPSS version 21.0

RESERACH FINDINGS AND DISCUSSION

- 1-A total of **115(55.8%)** males and females 91(44.2%).
- 2-More visit occur in the day **123(59.7%)** than the night 83(40.3)%.
- 3-About **174(84.5%)** new visits, **26(12.6%)** revisit for different problems, **6(2.9%)** revisit for the same problem.
- 4-Reasons for patients visits: **trauma 52(29.2%)**,GIT 36(18.5%),RS 25(12.8%),CVS 22(11.3%). { *Ref:Karaca(2012),Vegting(2015)* }



Distribution of patients based on the LOS of patients at the ED

N	LOS	Mean	Median	Min	Max	SD
206	Hours	3.83	2.20	0.03	21.84	4.04
206	Minutes	229.55	132	1.8	1260	242.63

	Percentiles						
	5	10	25	50	75	90	95
Weighted Average Time spent	0.32	0.64	1.00	2.20	5.10	9.29	12.72

*{Ref: Karaca(2012) had **3.26hrs**, Parker & Marco(2013) had **2.583hrs**, Bukhari(2014) had **3.02 hrs**, Vegting(2015) had **2.29hrs**, Chau(2017) had **1.46 hrs**}*

Distribution of patients based on the time of arrival and meeting the GMP and SMP

	Diff b/w time of arrival and meeting with GMP (min)	Diff b/w time of arrival and meeting with SMP (min)	Diff b/w meeting with GMP and meeting with SMP (min)
N	206	86	86
Mean	26.18	168.66	146.32
Std. Error of Mean	3.52	20.43	19.88
Median	15.00	102.00	87.00
Minimum	0.00	7.20	0.00
Maximum	666.00	960.00	918.00
SD	50.46	189.47	184.38

50% of the patients spend <15mins to see the GMP and the others \geq 15mins

50% of the patients spend < 102mins(1.7hrs) to see the SMP.

50% of the patients spend < 87mins(1.45hrs) to see the SMP after meeting the GMP.

Distribution based on age range in three categories & LOS

Age range	N	Mean	Median	Min	Max	SD
<30	50	2.93	1.50	0.13	14.85	3.56
30-59	113	4.11	2.67	0.03	21.84	4.25
≥60	43	4.13	3.17	0.23	21.00	3.95
Total	206	3.83	2.20	0.03	21.84	4.04

Kruskal Wallis Test: $H=5.988$; $P=0.048$

{Ref: Karaca(2012), Vegting(2015)}

Distribution based on marital status and LOS at the ED

Marital status	N	Mean	Median	Min	Max	SD
Married	118	4.11	2.87	0.03	15.75	3.73
Single	74	3.28	1.50	0.13	21.84	4.26
Widow(er)s	14	4.25	2.50	0.30	21.00	5.30
Total	206	3.83	2.20	0.03	21.84	4.04

Kruskal Wallis Test: $H=6.884$; $P=0.032$

Table 4.10.3

Patient who were initially installed at the OSA spend more time of **5.35hrs** than does who were not placed at the OSA with **3.77hrs**) in the ED.

Distribution of patients based on the period of arrival and LOS

Period	N	Mean	Median	Min	Max	SD
Day	123	3.21	1.46	0.03	21.84	3.75
Night	83	4.72	3.25	0.36	18.14	4.31
Total	206	3.83	2.20	0.03	21.84	4.04

P=0.000 { Ref: Karaca(2012),Chaou(2017)}

Distribution of LOS based on the location with respect to Douala

Location with respect to Douala	N	Mean	Median	Min	Max	SD
Within Douala	182	3.53	2.00	0.03	21.84	3.69
Out of Douala	24	6.09	3.90	0.64	21.00	5.72
Total	206	3.83	2.20	0.03	21.84	4.042

Distribution based on nature of transfer and LOS

Nature of transfer	N	Mean	Median	Min	Max	SD
Referred	32	5.14	3.91	0.90	16.58	3.62
Non-referred	174	3.59	1.92	0.03	21.84	4.08
Total	206	3.83	2.20	0.03	21.84	4.04

Mann-Whitney U. U=1679.500; P=0.000

Ref: Bukhari(2014), Chaou(2017)

Non-insured patients spend a longer LOS at the ED of 3.94hrs than insured patients with 3.70hrs. *Mann-Whitney U. U=5262.000; P=0.929.*

Distribution comparing whether blood sample was collected and LOS at the ED

Blood sample collection	N	Mean	Median	Min	Max	SD
Not done	86	1.68	1.01	0.13	11.20	1.92
Done	120	5.36	4.00	0.03	21.84	4.45
Total	206	3.83	2.20	0.03	21.84	4.04

Mann-Whitney U=1810.500; P=0.000 Ref: {Markopoulou(2013), Chaou(2017)}

Patients whose blood sample was collected and deposited by a nurse spend a shorter time of **5.29hrs** as compared to does deposited by someone else with **5.40hrs** in the ED.

Distribution based on imaginary test done and LOS

Imaginary test done	N	Mean	Median	Min	Maxi	SD
No	102	3.69	1.94	0.13	21.84	4.18
Yes	51	5.11	3.86	0.64	21.00	4.15
Total	153	4.17	2.76	0.13	21.84	4.21

Mann-Whitney U=1750.500; P=0.001 Ref: {Vegting (2015), Karaca(2012), Chaou(2017)}

Patient who did CT-Scan while in the ED spend more time of **5.74hrs** than patients who did not with **3.64hrs**. Indicating that doing CT-scan is a contributing factor to increase LOS at the ED (*Mann-Whitney U=985.500; P=0.003*)

Patient who did X-ray while in the ED spend more time of **4.70hrs** than patients who did not with **3.59hrs**. Indicating that doing X-ray is a contributing factor to increase LOS at the ED (*Mann-Whitney U=2261.500; P=0.000*)

Distribution comparing the number of SMP consultation and LOS at the ED

Number of SMP consultation	N	Mean	Median	Min	Maxi	SD
1	74	4.87	3.97	0.64	21.84	3.82
2	7	8.77	7.95	3.86	14.40	3.47
3	3	5.77	4.60	3.70	9.00	2.84
Total	84	5.23	4.00	0.64	21.84	3.88

Kruskal Wallis Test: $H=9.355$; $P=0.009$

Ref: {Karaca(2012) , Bukhari(2014),Vegting(2015),Chaou(2017)}

Distribution comparing patients orientation and LOS at the ED

Orientation of patient	N	Mean	Median	Min	Max	SD
Hospitalized	73	5.24	4.60	0.64	16.58	3.41
Observed	23	8.61	7.45	0.03	21.84	6.51
Discharged	110	1.89	1.08	0.13	12.08	2.13
Total	206	3.83	2.20	0.03	21.84	4.04

Kruskal Wallis T, P=0.000. Ref: {Karaca(2012) ,Bukhari(2014),Vegting(2015),Chaou(2017)}

Patients' who were discharged home spend more time of **3.42hrs** than patients who were discharged to see a specialist with **2.44hrs**. But both discharged home and to see a specialist had an average LOS of **3.14hrs** in the ED.

(Mann-Whitney U: U=1039.000; P=0.043)

Distribution based on ESI and LOS

ESI	N	Mean	Median	Min	Max	SD
ESI-1	2	4.61	4.61	4.21	5.00	0.56
ESI-2	28	4.69	3.50	0.85	14.40	3.35
ESI-3	75	5.90	4.80	0.03	21.84	4.73
ESI-4	62	2.49	1.50	0.13	18.14	3.06
ESI-5	39	1.30	0.91	0.23	11.20	1.76
Total	206	3.83	2.20	0.03	21.84	4.04

Kruskal Wallis Test: $H=68.571$; $P=0.000$

Ref: {Reiter M & Scaletta T(2010), Karaca(2012), Bukhari(2014), and Chaou(2017)}

Statistical significant reasons for PLOS in the ED of the DGH

N	Variables	Statistical significant	LOS(hrs)
1	Advanced in age (≥ 60 yrs)	<i>p=0.048</i>	>4.1
2	Married and widow	<i>p=0.032</i>	>4.1
3	Arrival at night	<i>p=0.000</i>	4.73
4	Out of Douala	<i>p=0.009</i>	6.09
5	Referred	<i>p=0.000</i>	5.14
6	Ambulance Patients	<i>P=0.007</i>	5.24
7	Sample collected	<i>P=0.000</i>	5.36
8	Imaginary test done	<i>p=0.001</i>	5.11
9	SMP consultation SMP (2,3) consultation	<i>P=0.009</i>	4.87(1) 8.77(2), 5.77(3)
10	Orientation of patient Hospitalised /observed	<i>P=0.000</i>	5.24 8.60
11	ESI -1,ESI-2, ESI-3	<i>P=0.000</i>	4.61, 4.69, 5.90

Observed reasons for PLOS in the ED in the DGH

- 1. ED treatment:60(57.7%)**
- 2. Awaiting specialist:44(42.0%)**
- 3. Awaiting reception from hospitalization service:27(26.0%)**
- 4. Awaiting results laboratory:20(19.2%)**
- 5. Awaiting space for consultation:15(14.4%)**
- 6. Awaiting results radiology:14(13.5%)**
- 7. Financial reasons:12(12.5%)**
- 8. No space for admission:11(10.6%)**
9. Awaiting GMP:8(7.7%)
10. Awaiting materials for care:7(6.7%)
11. Awaiting porter:7(6.7%)
12. Awaiting CS:6(5.8%)

LIMITATIONS OF THE STUDY

- Our study took place in a single clinical setting.
- The study did not address the impact of financial incentives to staff on LOS of patients in the ED.

Essential Emergency Numbers

- ❖ 119=SAMU
- ❖ 118=Fire fighters
- ❖ 117=Police
- ❖ 113=Gendarmerie
- ❖ 233-50-01-01=Douala General Hospital(DGH)

CONCLUSION

- LOS is an effective marker of ED performance.
- The mean LOS was **3.83hours** in the ED of the DGH.
- LOS in the ED varies with: **time of arrival, age range, marital status, area and nature departure, diagnostic test, number of specialist consulted, patient orientation and patients severity index.**
- Core factors observed that prolong the LOS of patients in the ED were: **ED treatment, awaiting specialist, awaiting reception from hospitalisation service, and awaiting results,**

SUGGESTIONS

- Putting in place of a formal **reception, orientation** and **triage** system in the ED of the DGH .
- Carry out more research on the LOS in the ED.
- The process of laboratory and imaginary test should be **reviewed for ED patients.**
- **Encourage, support** and **finance research** on the LOS at the ED.

**THANKS FOR YOUR
ATTENTION**

Cameroon Nurses Association (CNA)
7th National Conference from the
25th to the 26th May, 2018
Held in Biaka University Institute Buea

Theme:
Regulation of Nursing Practice in
Cameroon