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Nursing Management of Women Admitted for Cesarean Section at the Ngaoundere Regional Hospital, Cameroon

Alh Ahmadou Mariyamou[1*]; Yaouba Djibrilla, Ph.D.[2]; Jacques Olivier Ngoufack Tsoumo[2,3]; Abdoul Rougayatou; Marthe Valentine Tsague, Prof.[2]

[1]Private Training School for Health Professionals of Meiganga, Cameroon.
[2]Departement of Biomedical Science, Faculty of Science, University of Ngaoundere, Cameroon.
[3]State Registered Nurses School of Ngaoundere, Cameroon.

[*]*Corresponding Author's Email: gouroudjamariyamou@gmail.com*

Abstract

Often lifesaving for both mother and child, caesarean section exposes patients to various postoperative risks. It requires high-quality and multidisciplinary management in which nurses play a central role. This study aimed to describe the nursing activities performed and their reporting rate among patients admitted for caesarean section at the Ngaoundere Regional Hospital. A cross-sectional study was conducted among 80 women hospitalized in the Gynaecology-Obstetrics Department of Ngaoundere Regional Hospital for caesarean delivery. Sociodemographic and clinical data of these women, as well as nursing interventions recorded in their medical files, were collected using a structured questionnaire and analyzed with Excel 2019.Descriptive statistics like average, and percentages were computed to analyze the data. Results showed that from the first to the third postoperative day, participants received an average of two daily doses of medication via different routes. Additionally, on average, two clinical monitoring activities and one other nursing intervention were performed daily for each patient during these three days. Overall, 80,1% of the 2139 medication doses administered, were reported, and 93% of the2362 monitoring activities were reported, whereas only and 15,4% of other 1280 nursing interventions were documented in patients' medical records. These results highlight the hight frequency of nursing interventions among caesarean patients and point out documentation challenges. They call for greater engagement of nursing staff and coordinators to improve organization and ensure optimal maternal outcomes.

Keywords: Caesarean Section, Nursing Management, Nursing Documentation, Postoperative Care, Maternal Care

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INTRODUCTION

Caesarean section is a surgical intervention performed during childbirth to correct or prevent complications such as foetal distress, abnormal foetal presentation, preeclampsia, or macrosomia, (Boatin et al., 2018; Utomo et al., 2022). It requires a high demand for nursing care, involving significant physical, intellectual, and emotional resources from nursing staff who collaborate with other healthcare professionals (WHO, 2015; Knight et al., 2019). I. According to the American College of Obstetricians and Gynaecologists (2020), systematic postoperative monitoring and nursing care should be mandatory for all patients undergoing surgical procedures with anaesthesia. Many authors underscore the critical need for targeted engagement with caesarean patients (Betrán et al., 2016; Wloch et al., 2012; Knight et al., 2019). However, some empirical observations reveal that nursing management requires improvement in many healthcare facilities in the Adamawa region in Cameroon (George & Dessalegn, 2026; Wanko Keutchafo et Kerr, 2019). A serious analysis of current nursing practice seems to be a real necessity, especially in this particular context. This may help to identify care workload and challenges. This study aimed to describe the nursing activities performed and their reporting rate among patients admitted for caesarean section at the Ngaoundere Regional Hospital.

LITERATURE

General Information on Caesarean Section

According to the World Health Organization (WHO,2015), a caesarean section is a surgical operation consisting of extracting the foetus through an incision made in the abdominal wall and the uterus. It is indicated only when vaginal delivery would endanger the life of the mother or the child. The WHO recommends caesarean rates between 10% and 15% of all births, as higher rates are not associated with reductions in maternal or neonatal mortality.

Caesarean sections may be classified according to several criteria. The most widely used system is based on the degree of urgency. However, increasing attention has been given to the Robson classification, which integrates several obstetric criteria and is primarily used to analyse caesarean-related data.This classification helps organize medical management efficiently, mobilize healthcare teams according to the situation, and ensure maternal and foetal safety.

The Royal College of Obstetricians and Gynaecologists (RCOG, 2010) distinguishes four categories:

Category 1 (Immediate emergency caesarean) – When the life of the mother or foetus is in immediate danger. Delivery must be achieved within 30 minutes following the decision. Examples: acute foetal distress (abnormal or critical foetal heart rate), massive haemorrhage, uterine rupture, or cord prolapse.

Category 2 (Urgent caesarean) – There is a threat to maternal or foetal health, but not immediately life-threatening. The procedure should be performed quickly but without haste. Examples: failure of labour progression, moderate foetal distress, or worsening severe preeclampsia.

Category 3 (Caesarean during labour) – Vaginal delivery is not possible, but there is no immediate risk. The procedure is planned and performed within hours depending on

operating room availability. Examples: dystocia with non-engaged presentation, failed induction, or failed instrumental delivery.

Category 4 (Elective caesarean) – The procedure is planned before the onset of labour for a known indication. It optimizes maternal and neonatal safety by avoiding complicated or risky labour. Examples: previous caesarean with contraindication to vaginal birth, breech or transverse presentation, or maternal pathology precluding labour.

The Robson classification is used to analyze caesarean section rates and identify high-risk groups in order to improve obstetric practices (Mbungu et al., 2017). It relies on five reproducible obstetric criteria: Parity (primiparous or multiparous); Foetal presentation (cephalic, breech, or transverse), Gestational age (>37 weeks or <37 weeks); Onset of labour (spontaneous, induced, or pre-labour caesarean); History of previous caesarean section.

Indications for caesarean delivery can be grouped into maternal, foetal, and mixed indications. Some examples Mechanical dystocia (narrow pelvis), Severe maternal pathologies (e.g., severe preeclampsia, active genital herpes), Previous caesarean section, Acute foetal distress, non-cephalic presentation (breech, transverse), Foetal macrosomia, Cephalopelvic disproportion, Multiple pregnancy with abnormal presentation (Haute Autorité de Santé [HAS], 2020).

The most common technique involves a transverse incision made a few centimetres above the pubis. After opening the abdominal layers, an incision is made in the uterus to extract the foetus and placenta. The uterus and abdominal wall are then sutured. The technique may vary depending on the clinical context and patient's history. It is performed under regional (spinal or epidural) or general anaesthesia and generally lasts between 30 and 60 minutes, depending on case complexity (Mbungu et al., 2017). Preoperative preparation includes fasting for at least six hours for solid foods and two hours for clear fluids, providing information and obtaining signed consent, possible pubic shaving and urinary catheterization, and positioning the patient in a left-tilted gynaecological position to avoid vena cava compression (American College of Obstetricians and Gynaecologists, 2020).

Recovery after caesarean delivery varies among women. Generally, postoperative pain ranges from moderate to severe in the first few days. Intestinal transit may be delayed; however, early mobilization is recommended to accelerate recovery and prevent complications. Some women may experience postpartum depression or "baby blues," particularly if the caesarean was unplanned. Therefore, emotional support is essential, along with careful monitoring of the surgical wound and prevention of thromboembolic or infectious complications through vital signs surveillance. Globally, it is recommended to prevent all possible complications such as wound infection, haemorrhage, urinary retention, or chronic pain (Medicine et Animation Pedagogue Anaesthesia et Reanimation, 2020). Prevention largely depends on effective postoperative nursing care.

Nursing Management of Caesarean Patients

Nursing management for caesarean patients follows a clinical approach forming the basis for personalized care. According to NANDA International (2016), this includes assessment, planning, implementation, and evaluation of nursing interventions.

Nursing assessment involves collecting subjective and objective data, such as vital signs, physical examination findings, and patient history. This enables nurses to understand the

patient's experience, identify strengths for health promotion, and detect potential or actual risks requiring prevention or intervention. Assessment can rely on specific nursing theories or standardized frameworks such as Gordon's Functional Health Patterns, which categorize data into manageable domains (NANDA-I, 2016).

Planning consists of defining interventions to address the patient's dependence or health problems while considering available resources. It involves establishing priorities among nursing diagnoses. According to NANDA-I (2016), a nursing diagnosis is a "clinical judgment concerning a human response to health conditions/life processes or vulnerability for that response by an individual, family, or community."

High-priority diagnoses should be addressed first to prevent or minimize complications and risks.

Implementation refers to the execution of planned technical, educational, or relational actions. It generally includes three stages: preparation, execution, and evaluation. Preparation involves the nurse, the patient, and the necessary equipment. The patient is informed of the procedure, its purpose, and safety measures, and their participation is encouraged. Execution follows established procedures and protocols documented in institutional manuals, which may be updated in accordance with evolving scientific evidence

METHODOLOGY

A facility-based cross-sectional study was conducted to assess postoperative nursing activities among women who underwent caesarean section at Ngaoundere Regional Hospital between 1 May and 30 June 2025. All eligible participants were consecutively recruited during the study period. Women were included if they had undergone a caesarean section at least 24 hours prior to data collection in the Gynaecology and Obstetrics Department and provided written informed consent to participate.

The data collection tool was pretested among 10 women admitted to the Gynaecology and Obstetrics Department between 1 and 10 April 2025. Following the pretest, six nursing interventions (hair care, nail care, blood transfusion, discharge planning, sitz bath, and body bath) were removed due to their limited relevance and applicability. Consequently, the nursing activities section was reduced from 28 to 22 items before final validation.

Data were entered and analyzed using Sphinx Plus and Microsoft Excel 2019. Descriptive statistics, including frequencies, percentages, and means, were used to summarize the findings and were presented in tables.

Data collection commenced after obtaining approval from the Adamawa Regional Ethics Committee for Human Health Research (Ref. No. 544/L/RA/DSP/BFP/NGD) and the Ethics Committee of Ngaoundere Regional Hospital (Ref. No. 110/L/RA/DSP/HR/CM/NGD). Written informed consent was obtained from each participant before data collection. All study data were handled confidentially and anonymized using unique identification codes.

RESULTS

Sociodemographic Characteristics of Participants

Table 1 presents the sociodemographic characteristics of the 80 women included in this study. The participants had a mean age of 26.2 ± 7 years, with the most represented age groups being 25–29 years (35%, n = 28) and 18–24 years (32.5%, n = 26). Regarding marital status, most participants were married (73.8%, n = 59) or single (21.3%, n = 17). Concerning educational level, women with secondary education were the most represented (40%, n = 32). In terms of occupation, the majority were housewives (55%, n = 44), followed by traders (32%) and salaried workers (13%).

Table 1: Distribution of Participants According to Sociodemographic Data

Variables	Category	n	%
Age	18 to 24 years	26	32.5
	25 to 29 years	28	35
	30 to 34 years	14	17.5
	35 à 39 years	12	15
Occupation	Housewives	44	55
	Traders	26	32.5
	Salaried workers	10	12.5
Education level	Primary	30	37.5
	Secondary	32	40
	Higher education	12	15
	Quranic	03	3.8
	No formal education	03	3.8
Marital status	Married	59	73.8
	Single	17	21.3
	Widowed	2	2.5
	Divorced	2	2.5

Clinical Characteristics of Participants

Table 2 summarizes the clinical characteristics of participants. Approximately 75% of the women underwent caesarean section at ≥ 37 weeks of gestation.

Based on urgency, most caesareans were Category 3 (38%, n = 30), followed by Category 2 (36%, n = 29), while cephalic presentation was the most frequent foetal presentation (84%).

Table 2: Clinical Characteristics of Participants

Clinical Data	Parameter	n	%
Gestational age	33 - 36 weeks	20	25
	37 - 42 weeks	60	75
Surgical urgency	Category 1	17	21

	Category 2	29	36
	Category 3	30	38
	Category 4	4	5
Foetal presentation	Cephalic	67	84
	Breech	9	11
	Transverse	4	5

Nursing Intervention During the Postoperative Period

Nursing interventions from the first to third postoperative day were grouped into three categories: Drug administration (described by doses and routes); Clinical monitoring activities (vital signs, wound observation, etc.) and other nursing interventions (education, hygiene, catheter care, etc.).

Drug Administration

The main routes of drug administration during the first three postoperative days were intravenous and oral. A total of 670 intravenous doses (≈ 3 doses/day/patient) and 726 oral doses (≈ 3 doses/day/patient) were administered. Additionally, 397 intravenous infusions were performed (≈ 2 per day per patient). While the use of oral route increased gradually over the three days, the use of other routes decreased proportionally. Overall, 2.139 medication doses were administered during the first three postoperative days, representing an average of 2 daily doses per patient across all routes.

Documentation of Medication

Approximately 80.1% (n = 1.713) of administered medication doses were documented in patient records. The highest documentation rates corresponded to intravenous and oral routes, while less than half of oral doses were recorded pulse.

Table 3: Distribution of Drug administration done and reported in participants' medical files

Route of drug administration	Day 1				Total			
	Done		Reported		Done		Reported	
	S	*m*	S	%	S	*m*	S	%
Intravenous drips	334	4	330	98.8	670	3	661	98.7
Intravenous infusions	238	3	235	98.7	397	2	382	96.2
subcutaneous injections	176	2	170	96.6	226	1	211	93.4
Intramuscular injections	61	1	58	95.1	120	1	107	89.2
Oral Route	9	0	0	00	726	3	352	48.5
Total of drug doses	818	2	793	96.9	2139	3	1713	80.1

S : sum; *m*: mean or average

Clinical Monitoring Activities and Clinical Monitoring Activities Documentation

The most frequent monitoring activities were blood pressure and temperature measurements, performed 466 and 457 times respectively. Equivalent to two checks per day per patient. Other monitoring included wound inspection (155) and urine output assessment (251).

In total, 2.362 monitoring acts were carried out during the first three postoperative days, with a peak on postoperative day two, indicating heightened vigilance during this period.

Similarly, 93% (n = 2.197) of clinical monitoring acts were documented, especially temperature, blood pressure, pulse, Respiratory rate, Urine output, Surgical wound dressing and Surgical wound bleeding

Table 4: Distribution of Monitoring Activities Done and Reported an Participants' Medical Files

Monitored Parameters	Day 1				Total			
	Done		Reported		Done		Reported	
	S	*m*	S	%	S	*m*	S	%
Blood pressure	117	1	117	100	466	2	466	94.2
Pulse	112	1	108	96.4	412	2	412	96.4
Respiratory rate	105	1	105	100	363	1	363	90.9
Temperature	208	3	208	100	457	1	457	98.9
Urine output	95	1	95	100	251	0	251	98,8
Surgical wound dressing	52	1	25	48.1	155	1	155	56.1
Surgical wound bleeding	99	1	99	100	258	1	258	94.6
Total of monitoring interventions	788	**1**	757	96.1	2362	1	2362	93.0

S : sum; *m*: mean or average

Other Nursing Interventions

Beyond medication and monitoring, nurses performed various other activities such as nutritional education (n = 233), venous line maintenance (n = 222), and urinary catheter care (n = 178). Less frequent activities included breast examination and breastfeeding education (n = 11).

However, documentation of these activities remained, with 15.4% recorded. The most consistently documented procedures were venous catheter insertion and removal, both achieving 100% documentation.

Table 5: Distribution of Other Nursing Interventions Performed and Reported

Interventions Performed	Day 1				Total			
	Done		Reported		Done		Reported	
	S	*m*	S	%	S	*m*	S	%
Breast examination	31	0	0	0,0	40	0	0	0,0
Nutritional education	79	1	0	0,0	233	1	0	0,0

Intravenous catheter insertion	63	1	63	100	115	0	115	100
Urinary catheter care	76	1	1	1,3	178	1	1	0,6
Intravenous line care	76	1	0	0,0	222	1	1	0,5
Oral hygiene	80	1	0	0,0	186	1	0	0,0
Breastfeeding education	1	0	0	0,0	11	0	0	0,0
Surgical wound dressing	76	1	1	1,3	134	1	3	2,2
Bladder training	21	0	0	0,0	84	0	0	0,0
Urinary catheter removal	13	0	13	100	77	0	77	100
Total	516	1	78	15,1	1280	1	197	15,4

S : sum; *m*: mean or average

DISCUSSION

The data collected and analyzed in this study highlighted the sociodemographic and clinical characteristics of participants, as well as the nursing interventions related to their postoperative management following caesarean section.

Sociodemographic Characteristics of Participants

The average age of participants was 26.2 ± 7 years, with the most represented age groups being 25–29 years (35%) and 18–24 years (32.5%). At these young ages, people are known to be the most active in reproductive health. In different contexts, significant relationship has been described between age and obstetrical issues. Studies have shown that women aged 35 years and older presented a higher risk of obstetric complications leading to caesarean delivery. Moreover, data from a study carried out in France revealed a significantly higher caesarean rate among women aged ≥ 35 years (Lesage, 2014; High Authority of Health [HAS], 2020).

In a large majority, study participants were married (73.8%), which is consistent with prior observations. A meta-analysis including African countries described marital status as a determinant of caesarean delivery, interacting with socioeconomic factors (Benova et al., 2019). Similarly, a study carried out in Nigeria reported that married women were more likely to access comprehensive prenatal care, including the option to plan for caesarean delivery (Adeyemi et al., 2019). In contrast, another study in Canada found that single mothers were more at risk of emergency caesarean delivery than married ones (Urquia et al., 2014).

Regarding their education, the majority (40%) of participants had reached secondary education level, which aligns with findings by Yaya et al. (2018) showing that women with higher education levels are more likely to undergo caesarean delivery compared to uneducated women. In Cameroon, Tchente Nguefack et al. (2020) observed that unschooled women were significantly less likely to have caesarean delivery despite a higher incidence of obstetric complications. Therefore, education may be considered a key determinant of reproductive health which influences access to maternal healthcare, understanding of delivery options, and communication with professionals.

Clinical Characteristics of Participants

The fact that 75% of caesareans were performed at normal term (gestational age ≥ 37 weeks), may Favour better neonatal outcomes as reported by Torloni et al. (2011), but the most important clinical fact seems to be the categorization of caesarean sections into four levels of urgency, which is critical for organizing obstetric management (RCOG, 2010). In the present study, Category 3 (38%) and Category 2 (36%) were most frequent. Category 2 refers to situations requiring rapid intervention due to deteriorating of maternal or foetal conditions, while Category 3 applies to non-urgent cases that require caesarean section within a reasonable timeframe. The predominance of Category 3 may indicate effective prenatal risk screening and anticipatory planning, while the proportion of Category 2 cases could reflect clinical instability or delayed referrals (Betrán et al., 2021).

Nursing Interventions

The findings of this study demonstrate intensive and diverse nursing activities during the first three postoperative days among caesarean patients at the NRH. Intravenous and oral routes were the core modes of drug administration, with 670 intravenous doses and 726 oral doses. The preference for intravenous administration in the acute phase is consistent with literature, emphasizing its rapid onset, optimal bioavailability, and dosage precision, particularly for antibiotics and analgesics (Stamer & Wulf, 2014). The 397 recorded intravenous infusions confirm active management of hydration, pain, and infection prevention. The gradual transition from intravenous to oral route across the three days reflects favourable postoperative recovery, aligned with Enhanced Recovery After Surgery (ERAS) principles (Nelson et al., 2016; Caughey et al., 2018). The total of 2.139 drug doses administered to participants highlights significant nursing workload and the necessity for strict protocols to ensure medication safety and traceability (World Health Organization [WHO], 2017).

Clinical monitoring, another cornerstone of postoperative nursing care, aims to detect and prevent complications like preeclampsia, haemorrhage, and infection (Magee et al., 2022; Smaill & Grivell, 2014). The most frequent parameters measured were blood pressure (466) and temperature (457), approximately twice daily per patient, aligning with WHO and obstetric best-practice guidelines (WHO, 2015). However, wound observation (n=155) and urine output monitoring (n=251) were less frequent, despite their critical importance in identifying haemorrhage, infection, or renal complications (American College of Obstetricians and Gynaecologists [ACOG], 2020).

The total number of 2362 clinical monitoring activities confirms the intensity of nursing care during this critical phase, underscoring the sustained efforts of nursing staff to monitor vital signs in this resource-limited setting (Atukunda et al., 2022). This may highlight the fact that clinical protocols are harmonised and consistently implemented to reduce maternal morbidity and mortality in this context.

Among other interventions, the study found frequent performance of nutritional education, Intra venous line maintenance, and catheter care. Nutritional education promotes tissue recovery, hematologic function, and breastfeeding readiness (Kavle & Landry, 2018), particularly crucial in contexts with nutritional deficiencies (WHO, 2021). Venous and urinary catheter maintenance are vital for preventing nosocomial infections, which constitute up to 80% of urinary infections in hospitals (Tambyah & Oon, 2022). The low frequency of breastfeeding education and breast examination is concerning, given WHO's recommendation to support early initiation of breastfeeding after caesarean delivery (WHO,

2020). This gap may reflect limited integration of newborn-centred obstetric care in postoperative routines.

Documentation of Nursing Activities

The quality of nursing care extends beyond performance to include documentation, which ensures continuity, accountability, and legal protection. In this study, 80.1% of medication doses and 93% of monitoring activities were recorded, but oral drug documentation and non-clinical interventions were often omitted. Such gaps may stem from work overload, non-standardized reporting tools, or insufficient awareness of documentation importance (Chuang et al., 2020).

Accurate documentation is critical for clinical continuity, audit, and research, as well as for evaluating care quality (American Nurses Association, 2021). Inadequate recording of wound status and bleeding is particular, as these parameters are crucial for detecting secondary haemorrhage or surgical-site infections, which are known as major contributors to maternal morbidity and mortality (Say et al., 2014). Furthermore, the underreporting of educational activities conceals a substantial portion of nursing work, limiting the ability to assess care quality comprehensively. Poor documentation compromises interprofessional coordination, it may lead to medication errors, and undermines the visibility of nursing contributions to patient outcomes (Reid et al., 2021).

Implications for Research and Practice

This study reinforces the pivotal contribution of nurses to the quality and safety of postoperative care following caesarean section, particularly within resource-limited health systems. The findings reveal substantial gaps in documentation and continuity of management that must be addressed through evidence-based reforms.

From a research standpoint, future studies should adopt multicentre and longitudinal designs to examine how structured nursing interventions, digital documentation systems, and interdisciplinary collaboration affect maternal outcomes. Strengthening the evidence that the effectiveness of these strategies will support the development of context-adapted models of obstetric nursing care across Africa. Ultimately, bridging the gap between empirical evidence and nursing practice will not only enhance maternal health outcomes but also elevate the visibility and professional value of nurses within multidisciplinary healthcare teams.

CONCLUSION

This study aimed to describe the distribution of nursing activities performed for women admitted for caesarean section at the Ngaoundere Regional Hospital. The findings demonstrate that nursing management for post-caesarean women is both intensive and diverse, on all sides of a broad range of pharmacological, monitoring, and educational interventions. Despite this density of nursing interventions, significant gaps persist in documentation and patient education. The results underline the critical role of nurses in postoperative management and maternal safety, while highlighting the need for systematic documentation, enhanced coordination, and continuous professional training. Strengthening these dimensions is essential to improving the quality, safety, and efficiency of maternal healthcare services in resource-limited contexts such as Cameroon.

Future Research

Future studies should consider larger samples and cover the entire postoperative hospitalisation period for better assessment of nursing activities and patient outcomes. Preoperative nursing management should also be considered.

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