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PROBLEMS ASSOCIATED WITH THE CARE OF PREMATURE INFANTS AT THE CINQUANTENAIRE HOSPITAL IN KISANGANI, DEMOCRATIC REPUBLIC OF THE CONGO

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ABSTRACT

Introduction: The fourth Millennium Development Goal (MDG), which aims to reduce child mortality by two-thirds by 2015, requires improving the quality of obstetric and neonatal care in order to reduce neonatal mortality. This study focuses on the challenges associated with the care of preterm infants at the Cinquantenaire Hospital in Kisangani, Democratic Republic of the Congo. It aims to identify the main challenges faced by pediatric nurses in the care of preterm infants and to analyze the practices of pediatric nurses in this area.

Methods: This is a descriptive study based on direct structured interviews. In this study, we recruited 37 pediatric nurses who completed our survey questionnaire from January 1 to March 31, 2026.

Results: The main problems encountered by pediatric nurses in the care of premature infants are the insufficient number of incubators (40.6%), the lack of necessary equipment for caring for premature infants (24.3%), unexpected power outages (21.6%), and the shortage of certain medications deemed essential (13.5%). Furthermore, 43.2% of respondents reported that the parenteral route was indicated for administering 10% glucose solution and the enteral route for administering milk at 48 hours.

Conclusion: The care of premature infants in our healthcare facilities poses significant challenges in terms of equipment and human resources; therefore, it is essential to improve the care of premature infants in order to reduce the neonatal mortality rate.

Keywords: Challenges, Care, Premature Infants, Pediatric Nurses.

1 INTRODUCTION

Preterm birth is defined as a birth occurring before 37 completed weeks of gestation. It has always been a global health issue due to the immaturity and fragility of preterm infants. The WHO also reports that perinatal mortality was 3.4%. For the first three months of 2019, mortality among preterm infants was 39%, excluding infants weighing less than 1,100 g [1, 2].

Preterm birth is the most common direct cause of neonatal mortality. Associated with small-for-gestational-age (SGA) status, preterm birth is the primary cause of low birth weight and a major indirect cause of neonatal death [3]. The issue of premature infant survival and the care it requires first emerged in highly developed countries, as its impact is all the more significant given that neonatal mortality is low for the general population. Sub-Saharan Africa and South Asia account for more than 80% of premature births worldwide. Of the 15 million children born prematurely each year, more than one million die from complications related to premature birth [4].

The survival of premature infants therefore appears to be highly uncertain; Hugon J. [5] reports a mortality rate of 17.8%; in contrast, Lenclen R, Mazraani M, et al. [6] found a rate of 46.5%. A mortality rate of 35% was observed prior to discharge from the maternity ward. Low birth weight accounts for 60 to 80% of all neonatal deaths. The global prevalence of low birth weight is 15.5%, representing approximately 20 million infants with low birth weight each year, 96.5% of whom are born in developing countries [7].

In the Democratic Republic of the Congo, the mortality rate for preterm infants is 28%; it rises to 83.3% for gestational ages < 28 weeks. Premature newborns are extremely fragile, and their care can often only be provided in a specialized unit equipped with appropriate equipment and qualified staff. This care is an emergency because prematurity poses an immediate threat to the newborn's life and future neurological development. It begins in the delivery room [8]. The DRC is among the countries with very high neonatal mortality rates. One in 35 newborns dies before the age of one month, or 96,000 newborns per year.

According to Tina Katamea et al. [9], complications of prematurity, asphyxia, and neonatal infections such as sepsis and pneumonia account for more than 80% of neonatal deaths, according to the report. Improving the hospital work environment by providing access to drinking water and implementing hygiene and infection prevention measures is also important. The results of a retrospective descriptive study evaluating the care of preterm infants at the Kisangani University Clinics, involving 82 preterm infants admitted to the Department of Pediatrics from January 2007 to December 2012 revealed that birth weight ranged from 700 g to 2,420 g (mean $1,485 \pm 280.3$ g; median 1,485 g). Very preterm infants (33–36 weeks' gestational age and 6 days) were the most numerous. The mean weight gain was 12.5 ± 9.5 g/kg/day [10].

The use of an incubator serves a dual purpose: on the one hand, it helps warm the premature infant so that it can gain weight, since its thermoregulatory system is not yet fully developed. But it also isolates the newborn because most of its vital functions are underdeveloped. This exposes the baby to the risk of constant infection in the open air, especially when the environment is unhygienic.

Maternity wards lacking incubators in Kisangani and throughout Tshopo Province, in the northeast of the Democratic Republic of the Congo (DRC), care for premature babies using hot water until they reach a satisfactory weight. This is due to the glaring lack of incubators in the maternity ward. In most cases, nurses ask parents to place plastic bottles filled with hot water next to their premature newborns at all times. These bottles of hot water, placed on either side of the premature baby, are wrapped in a cloth to warm the newborn without burning it. The hot water is replaced every three hours. It is the heat it gives off that warms these very vulnerable little beings, just as in the mother's womb before birth. However, ensuring that this heat remains constant around the premature baby is no easy task.

Healthcare providers working in the neonatal department bear a heavy medical responsibility regarding the care of premature infants, given that essential medical equipment and supplies are sorely lacking in most healthcare facilities in Kisangani, making the care of premature newborns much more difficult and complicated.

The primary objective of this study is to analyze the working conditions of pediatric nurses in order to improve the care and overall management of premature newborns with the aim of reducing the neonatal mortality rate. Specifically, the study seeks to identify the main challenges faced by pediatric nurses in the care of preterm infants and to analyze their practices in this area.

2 METHODS

2.1 Description of the Study Setting

Our study was conducted at the Cinquantenaire Hospital of Kisangani. This Hospital is located in the Commercial District, Makiso Commune, in Tshopo Province, The Democratic Republic of the Congo. Geographically, the Cinquantenaire Hospital in Kisangani is bordered by:

- to the east, the Road Authority garage and the residences on First Avenue in Kabondo;
- to the west, the facilities of the Chinese company Zhe Ngwey Technical Cooperation;
- to the north, the road known as TP and the Military Police Camp;
- to the south, the buildings of the Faculty of Sciences at the University of Kisangani.

2.2 Study Design

To carry out our study, we used a cross-sectional descriptive method, as we collected data once at a specific point in time from the study population, which consisted solely of healthcare providers at the relevant healthcare facilities.

2.3 Study Population

The population of interest for this study consisted of 37 pediatric nurses working in the Neonatology Department at the Cinquantenaire Hospital of Kisangani, the subject of this study, during the study period from January 1 to March 31, 2026. For this study, we therefore used an exhaustive sample.

2.4 Data Collection Method

In our methodological approach, we chose the structured face-to-face interview as our data collection method. This method allowed us to gather information on the healthcare provider's experience with caring for premature infants. The aim here is to reveal nurses' understanding of the care of premature infants and the characteristics of a health issue within a group of people or a population, using clinical or paraclinical measurements or by interviewing individuals. To align the methodology with the study's objectives and enable us to collect and store the information necessary for analysis, we used an interview guide and participant observation as our data collection tools.

2.5 Data Analysis and Processing

The collected data were organized into frequency tables and then converted into percentages. Data entry, coding, and univariate and bivariate analysis were performed using SPSS version 22. We used Pearson's chi-square test to determine the independence between two variables at a significance level of 0.05. To do this, we coded the variables and parameters numerically. This coding allowed us to thoroughly analyze the data using statistical tests. Descriptive statistics (absolute and relative frequencies, percentages, and the mean) were used to describe the sociodemographic data of pediatric nurses.

2.6 Ethical Considerations

Participation in this study was, of course, voluntary. Consent was free, informed, but only verbal. Respondents were told that if they agreed to participate in this study, they would be given a questionnaire to collect information related to our study. Respondents who freely agreed to participate could withdraw from the study at any time without any penalty.

3 RESULTS

3.1 Profile of the respondents

As shown in this table, the ages of the study participants ranged from 23 to 57 years, and most of the participants fell within the 23–30 age groups, accounting for 40.5%. The majority of participants were female (54.1%), compared to 45.9% who were male. Regarding educational level, the majority of the subjects surveyed had a university degree, specifically 51.4% of registered nurses and 43.2% of licensed practical nurses. Finally, 86.5% of the subjects had less than 10 years of experience.

Table 1: Distribution of study participants by sociodemographic characteristics

Respondent Profile	f (n=37)	%
Age (years)		
23–30	15	40.5
31–39	13	35.2
40–48	7	18.9
49–57	2	5.4
Gender		
Male	17	45.9
Female	20	54.1
Education Level		
Certified Nurse (A2)	2	5.4
Registered Nurse	19	51.4
Licensed Nurse	16	43.2
Years of Experience (years)		
1–10	32	86.5
11–20	2	5.4
21–30	2	5.4
31–40	1	2.7

3.2 Pediatric Nurses' Opinions on the Care of Preterm Infants

Table 2: Pediatric Nurses' Opinions on the Practice of Caring for Preterm Infants

Pediatric Nurses' Views on the Care of Preterm Infants	f (n=37)	%
Factors Associated with the Care of Preterm Infants		
Birth weight less than 1,800 g	16	43.2
Risk of infection	9	24.3
Hypothermia	7	18.9
Absence of sucking and swallowing	5	13.5
Indications for enteral and parenteral feeding		
Administer 10% glucose solution parenterally	16	43.2
Administer milk enterally after 48 hours	21	56.8
Neonatal unit management		
Limiting the number of visits	21	56.8
Routine hand washing	9	24.3
No shoes allowed	5	13.5
Disinfection of the room and equipment	2	5.4

A review of this table suggests that several factors may necessitate the use of artificial feeding for premature infants; those most frequently cited by pediatric nurses are low birth weight (43.2%); risk of infection (24.3%); hypothermia (18.9%); and the inability to suck and swallow (13.5%). Furthermore, 43.2% of respondents reported that, in the care of preterm infants, the parenteral route was indicated for administering 10% glucose solution and the enteral route for

administering milk at 48 hours. Neonatal unit management was closely linked to limiting the number of visits (56.8%), systematic handwashing (24.3%), a ban on wearing shoes (13.5%), and disinfection of the unit and equipment (5.4%).

3.3 Rearing practices for premature infants

Table 3: Distribution of subjects by rearing practice for premature infants

Care of Premature Infants	f (n=37)	%
Challenges in Caring for Premature Infants		
Insufficient number of incubators	15	40.6
Lack of necessary equipment	9	24.3
Unexpected power outages	8	21.6
Shortage of certain essential medications	5	13.5
Difficulties related to feeding premature infants		
Difficulty digesting milk	20	54.1
Necrotizing enterocolitis	7	18.9
Improper milk preparation	6	16.2
Food intolerance	3	8.1
Failure to establish a venous access	1	2.7
Working conditions in neonatology		
Sufficient	12	32.4
Insufficient	25	67.6
Inadequate conditions in neonatology		
Lack of appropriate equipment	10	40.0
Failure to maintain aseptic conditions during care	7	28.0
Staff shortages	5	20.0
Cramped ward space	3	12.0
Other issues related to the parents of premature infants		
Low parental income	21	56.8
Failure to follow healthcare providers' instructions	11	29.7
Low parental education level	3	8.1
Religious beliefs prohibiting blood transfusions	2	5.4

A review of this table indicates that there are several problems associated with the care of premature infants; the most frequently cited are the insufficient number of incubators (40.6%), the lack of necessary equipment for caring for premature infants (24.3%), unexpected power outages (21.6%), and the shortage of certain medications deemed essential (13.5%). Regarding the feeding of premature infants, it appears that 54.1% of respondents reported difficulty for the infant to digest milk, followed respectively by necrotizing enterocolitis (18.9%), improper milk preparation (16.2%), food intolerance (8.1%), and failure to establish a venous access (2.7%). Regarding working conditions in neonatology, 67.6% of respondents stated that they worked in conditions unsuitable for caring for premature infants, specifically the lack of appropriate equipment (40.0%), failure to maintain aseptic conditions during care (28.0%), staff shortages (20.0%), and cramped ward conditions (12.0%). Finally, regarding issues related to the parents of premature babies, respondents highlighted low parental income (56.8%), failure to follow medical staff instructions (29.7%), low parental education levels (8.1%), and religious beliefs prohibiting blood transfusions (5.4%).

3.4 Bivariate Analysis

The table below presents the chi-square test of independence to determine whether there is a significant association between issues related to the care of premature infants and factors promoting such care, on the one hand, and difficulties faced by the parents of premature infants and poor working conditions, on the other.

Table 3: Association between issues related to the care of premature infants and factors promoting such care

		Challenges Encountered in the Care of Premature Infants				
		Insufficient number of incubators	Lack of necessary equipment	Unexpected power outages	Shortage of essential medications	Low parental income
		Number	Number	Number	Number	Number
Factors Contributing to the Practice of Raising Premature Infants	Low birth weight	0	2	4	0	1
	Hypothermia	1	6	2	2	5
	Risk of infection	4	0	1	3	1
	Inability to suck and swallow	2	1	1	0	1
	Respiratory distress	0	0	0	0	0
Challenges Faced by Parents of Premature Infants	Low income	4	5	5	2	5
	Failure to follow healthcare providers' instructions	2	3	1	2	3
	Low educational level	1	1	1	0	0
	Religious beliefs	0	0	1	1	0
Poor working conditions	Cramped neonatal unit	0	2	1	0	0
	Failure to maintain aseptic conditions	1	3	2	0	4
	Shortage of nursing staff	3	0	4	2	2
	Lack of appropriate equipment	3	4	1	3	2
	Lack of continuing education on the care of premature infants	0	0	0	0	0

When comparing the challenges associated with raising premature infants to the factors that facilitate raising premature infants, the difference is found to be significant ($p = 0.049$). Furthermore, the difference is not significant when considering difficulties related to parents ($p = 0.843$) and poor working conditions ($p = 0.267$).

4 DISCUSSION

4.1 Educational Level

We noted that the vast majority of the subjects surveyed at the Cinquantenaire Hospital of Kisangani had a university education, comprising 51.4% of nurses with a bachelor's degree and 43.2% of nurses with a master's degree. At Sendwe Hospital in Lubumbashi, Sangwa SJ., et al [8] in their study on "Care of preterm infants using the kangaroo method versus the conventional method: Morbidity and prognosis at Sendwe General Hospital in Lubumbashi (DR Congo)," noted that the majority of healthcare providers were licensed nurses, accounting for 63.4%, and in Cotonou, Balaka B,

& al [11] recruited 59.5% of nurses who held a master's degree. Graduated nurses predominated in this study because they tend to enter the workforce immediately after completing their undergraduate studies in order to gain in-depth knowledge and experience in the profession. This also results from the hiring policy advocated by employers, who avoid recruiting highly qualified staff to minimize labor costs.

4.2 Years of Experience in the Profession

This study shows that the vast majority of participants had 10 years or less of experience, accounting for 86.5%. In Lubumbashi, Sangwa SJ et al. [8] found that 65.7% of healthcare providers had 15 years or more of experience. Furthermore, in the pediatrics department of the Owendo–Libreville Pediatric Hospital (Gabon), Koko J, & al [12] found that 69.5% had already accumulated more than 10 years of experience in the profession. This situation is likely due to the fact that, in most cases, healthcare providers who had recently completed their studies were recruited to provide care in healthcare facilities. Since this is a predominantly young population, it is only natural that they do not have many years of experience in the nursing profession. The more years spent in the profession, the greater the experience in caring for preterm infants.

4.3 Pediatric Nurses' Views on the Care of Preterm Infants

4.3.1 Factors Contributing to the Care of Preterm Infants

Respondents identified a variety of factors favoring the practice of skin-to-skin contact, notably low birth weight (43.2%); risk of infection (24.3%), hypothermia (18.9%), and absence of sucking and swallowing (13.5%). Several studies have identified the same factors [13, 14], and Sangwa SJ & al. [8] found low birth weight, risk of infection, and hypothermia in 49.5%, 37.2%, and 10.4% of cases, respectively. According to Berger TM, & al [2], prematurity is defined by the gestational age at which infants are born. Previously, any child weighing < 2.5 kg was considered premature. Although preterm infants tend to be small, this weight-based definition is incorrect, as many children weighing < 2.5 kg are in fact full-term, post-term, or post-mature and small for their gestational age. They have different characteristics and face different challenges.

We believe that preterm infants are characterized by preterm gestational age, low birth weight due to maternal age under 18 or over 35, lack of prenatal care, primiparity and prematurity, multiple pregnancy, and female sex. Furthermore, infection and hypothermia in preterm newborns are thought to be caused, respectively, by maternal infection during pregnancy and delivery in an area where the ambient temperature is below the recommended level, as well as by maternal hypotension.

4.3.2 Indications for Enteral and Parenteral Routes

In this study, 43.2% of respondents reported that the parenteral route was indicated for administering 10% glucose solution and the enteral route for administering milk at 48 hours. According to the WHO [3], the nutrition of premature newborns is a major challenge in neonatology, as these infants have very low energy and nutrient reserves. The choice between enteral (via the digestive tract) and parenteral (intravenous) feeding depends on many factors related to the baby's immaturity and health status. Often, these two feeding methods are used in a complementary manner. We believe that the respondents did not deviate from the literature, which states that premature newborns are fed parenterally in the first few hours after birth and then enterally 48 hours later.

4.3.3 Neonatal Unit Room Management

According to respondents, neonatal unit room management was closely linked to limiting the number of visitors (56.8%), systematic handwashing (24.3%), prohibiting shoes (13.5%), and disinfecting the room and equipment (5.4%). In this regard, Jefferies, & al [15], states that neonatal unit room management is a complex and crucial area that aims to ensure the best possible care for premature or full-term newborns with health problems. It rests on several interdependent pillars such as the organization and environment of care, parental involvement, the team and equipment, the roles and objectives of caregivers, etc.

Limiting the number of visitors is a reason to keep the neonatal unit room clean and quiet, as the spread of infection can be caused by visitors. Systematic hand washing is justified in order to preserve aseptic and antiseptic conditions in the room.

4.4 Practices of Raising Premature Infants

4.4.1 Problems Associated with Raising Premature Infants

At the Cinquantenaire Hospital in Kisangani, respondents raised several problems, the main ones being an insufficient number of incubators (40.6%), a lack of equipment necessary for raising premature infants (24.3%), frequent power

outages (21.6%), and a shortage of certain medications considered essential (13.5%); the difference was not statistically significant ($p=0.049$). In Lubumbashi, Tina Katamea et al. [9] demonstrated the same issues, highlighting the lack of equipment for raising premature infants and the absence of essential medications, at 56.1% and 32.5% respectively. Furthermore, Sangwa SJ., et al. [8] raised the major problem of insufficient modern equipment for the care of premature newborns.

A well-organized healthcare facility must equip itself with modern equipment adapted to the clinical context of the cases to be treated in order to provide quality medical care. The inadequacy of equipment simply indicates a lack of organization within services, and the frequent power outages in healthcare facilities are a characteristic of developing countries, where water and electricity problems are acute.

4.4.2 Difficulties related to feeding premature infants in the hospital

It emerged that 89.2% of subjects reported difficulties related to feeding premature infants in the hospital, among whom 54.1% indicated difficulty digesting milk, necrotizing enterocolitis (18.9%), improper milk preparation (16.2%), food intolerance (8.1%), and failure to establish venous access (2.7%). In Niamey, Kamaye, M. & al. [14] demonstrated the same difficulties in premature newborns: the newborn's inability to digest milk (63.7%) and failure to establish venous access (37.3%). The inability of the premature newborn to digest milk and the failure to establish venous access would be due to the immaturity of major digestive functions and vital cells.

4.4.3 Working Conditions in Neonatology

It was observed that 67.6% of the subjects surveyed reported working in poor conditions in neonatology. Among these, the lack of appropriate equipment was the most frequently cited issue (40.0%), followed by failure to maintain aseptic technique during patient care (28.0%), insufficient staffing (20.0%), and cramped room conditions (12.0%). The difference was not statistically significant ($p = 0.267$). In Lubumbashi, Sangwa SJ, & al. [8] reported the same problems as we did, including the lack of appropriate equipment and insufficient staffing in the neonatology department. A study conducted at the Issaka-Gazoby Maternity Hospital in Niamey, evaluating the management of low birth weight newborns using the kangaroo care method, shows that working conditions in the neonatal unit are adequate (60.5%) [14]. Working in the neonatal unit, especially caring for premature newborns, is both a fascinating and demanding profession. Working conditions must be considered from several technical, organizational, and human perspectives. Despite the challenges, neonatal work is often perceived as very rewarding by professionals. The work environment, while technically demanding, can also be described as peaceful and focused on the well-being of the child and their family [16].

As previously mentioned, the lack of necessary equipment for newborn care, frequent power outages, and insufficient staffing in the department sufficiently justify the poor working conditions. For proper organization of care in the neonatal unit, adequate staffing is essential, especially when caring for a large number of premature newborns. Overwork in the unit can lead to stress and fatigue, which can negatively impact the quality of medical and nursing care.

4.4.4 Problems Related to Parents of Premature Infants

Many parents face numerous challenges in raising premature infants. In this series, we noted that 81.1% of the subjects in the study highlighted the parents' low income. The difference is not statistically significant ($p = 0.843$). Kalume M & Kizonde K [17] report non-compliance with instructions from healthcare professionals (56.8%) and low levels of parental education (39.7%). Given that we live in one of the poorest countries, a developing country characterized by poverty or low income, many parents of premature newborns are no exception. Caring for this category of newborn requires significant resources, and this presents a considerable challenge for parents. Furthermore, the low level of parental education often leads them to rely on traditional beliefs, etc.

5 CONCLUSION

The rearing and overall care of premature newborns constitutes a bottleneck in our health facilities, particularly at the Cinquantenaire Hospital in Kisangani, where healthcare providers face serious problems related to equipment and other medical devices which are almost non-existent; in addition to this, the healthcare staff are not specialized in the rearing of premature infants for effective care.

Countries can reduce their neonatal and infant mortality rates by improving maternal care during pregnancy and childbirth, as well as care for low birth weight infants. The practice of raising premature infants in our healthcare facilities poses significant challenges in terms of both equipment and human resources; therefore, improving the care of premature infants is essential to reducing neonatal mortality rates.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Acknowledgments

Michel LOMALISA LIKUNDA conceived the topic and collected the data; Martin OFUKA LOKATUNGA formatted the text; and Raymond ASSANI RAMAZANI processed the text. The other authors contributed financially.

Disclosure of conflict of interest

The authors believe there is no conflict of interest in the writing of this article.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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