



Clinical profile of children admitted at a tertiary government hospital with prolonged length of stay from January 2023 to December 2023

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OBJECTIVE: This study describes clinicodemographic profiles of children with prolonged length of stay admitted at the regular service ward of Philippine Children's Medical Center (January 2023 – December 2023)

MATERIALS AND METHODS: A descriptive and retrospective clinical profiling of patients with prolonged length of stay at PCMC was done (January 2023 to December 2023). Included were patients aged 1-18 years old admitted at the regular service ward and discussed during the overstaying audit. Excluded were those admitted at Neonatal Intensive Care Unit and Newborn Service Ward. Patients with prolonged length of stay admitted under the Hematology and Oncology Service ward and those with incomplete chart information were also excluded. Data collected were age, sex, area of residence, presence of comorbidities, diagnosis, reason for prolonged length of stay, and clinical outcomes.

RESULTS: 153 patients were included in this study. Majority of the patients with prolonged length of stay were adolescents (43.79%). Most of the patients identified in this study were female (78%). Those who overstayed were predominantly from Quezon City (27.45%). Comorbidities were present in 93.46% of patients. Neurologic conditions accounted for majority of the admissions (35.29%). Most common reason for overstaying of patients was due to a medical reason (91.5%). Furthermore, 93.46% of patients were discharged while 6.54% died.

CONCLUSION: This retrospective study presented the clinical profile of patients with prolonged length of stay who were mostly adolescents, with female predominance. Neurologic disease was the most common diagnosis identified among patients. Those patients who have prolonged length of stay were generally because of medical problems due to the complexity and chronicity of their disease. Strengthening ongoing service delivery network and prompt subspecialty referrals and involvement may be recommended to address discharge delays and maximize hospital resources.

KEYWORDS: *Prolonged length of stay, clinical profiles, treatment outcomes*

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The authors affirm that this manuscript is original, has been read and approved by all contributing authors, that each author meets the established criteria for authorship, and that the content represents a truthful and accurate account of the work conducted.

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INTRODUCTION

Length of stay in hospitals is the period from admission to discharge and is crucial for evaluating hospital performance. Prolonged hospital stay, defined as over 10 days as per our hospital policy, is a concern as they may indicate lower care quality, increased resource utilization, and affect bed turnover and waiting times. Factors influencing prolonged stays include infections, disease severity, and delays in diagnostic and therapeutic procedures. Delayed discharges burden families and healthcare providers with additional costs and potential inpatient complications. [1,2] Length of stay is a crucial performance indicator measured as the time between admission and discharge. Previous research has identified several factors influencing the duration of hospital stays. Prolonged length of stay impacts patient health outcomes and hospital resource utilization. Identifying the clinical profile of patients with extended stays can guide healthcare providers and administrative teams in developing strategies to address discharge delays and optimize hospital resources. This, in turn, can help reduce hospital waiting times for ward admissions and prevent bed shortages. [3]

There is still no study done involving pediatric admissions and prolonged length of stay in our country. The result of this study may indicate hospital efficiency and quality of patient care being delivered. This study may also be used

as a tool for other institutions in making clinical and administrative decisions for future pediatric admissions and prevent discharge delays and prolonged length of hospital stay. The variables influencing the patient's length of stay are not universally agreed upon. However, factors can be categorized into groups such as demographics, clinical factors, management factors, and hospital characteristics. The demographic information includes details about the patient, including age, sex, occupation, and residence. Clinical factors noted were quantity of prior admissions, the reason for referral, and the reason for admission. Among the management factors are admission on various days of the week, insurance type, admission type, and payment method. Hospital characteristics include the ward where the patient is admitted, the doctor's specialization, and their educational background. [1]

This study aims to describe the clinicodemographic profile of patients with prolonged length of stay admitted at the regular service ward in Philippine Children's Medical Center from January 2023 to December 2023. Furthermore, it will determine the age and sex distribution of patients with prolonged length of stay at PCMC, identify their area of residence, diagnosis, presence of co-morbidities, and determine reasons contributing to prolonged length of stay of patients such as diagnostic procedure, healthcare associated infection, medical problem, and socioeconomic factors.

This study aims to assess the clinical outcomes of patients with prolonged length of stay. In addition, prevalence of prolonged length of stay from January 2023 to December 2023 will also be determined. Identifying patients with prolonged length of stay and causes of discharge delays can improve hospital efficiency and quality of patient care. These may also guide clinical and administrative decisions, including careful consideration of vulnerable patients and cautious use of hospital resources. [4] Hospital management will benefit from looking into and assessing length of stay, particularly in terms of setting priorities, enhancing services, and allocating resources sensibly based on patient variations in length of stay and demographic considerations. [1]

MATERIALS AND METHODS

The investigator employed a descriptive and retrospective clinical profiling of children admitted in PCMC for more than 10 days from January 2023 to December 2023 and discussed during the monthly overstay audit. This study was approved by the Philippine Children's Medical Center Institutional Review Board (Appendix A).

Included in the study are service patients aged 29 days up to 18 years and 364 days old admitted at the regular pediatric ward (general service and the subspecialty divisions) and those transferred to the regular pediatric ward from the intensive care unit between January

2023 to December 2023 who were discussed in the overstay audit

Patients who were admitted at Neonatal Intensive Care Unit and Newborn Service Ward, patients admitted under the Hematology and Oncology service (since they are not included in the overstay audit), and patients with incomplete chart information and details were excluded in this study.

The principal investigator sought approval from the Institutional Review Board and Ethics Committee prior to the start of the study. A letter of request was sent to conduct research in the medical records section and the data collection proceeded considering ethical considerations. The data collection proceeded after review and approval by the Institute Review Board – Ethical Committee.

List of patients admitted at the regular ward of the Philippine Children's Medical Center from January 2023 to December 2023 who were included in the overstay audit was requested from the administrative office. Available zoom recordings of the monthly overstay audit from January 2023 until December 2023 were also retrieved to aid the list of overstay patients provided. All admissions that fulfilled the inclusion criteria were encoded and included in the research study. Data of patients such as name, age, sex, date of admission, diagnosis, and primary reason for overstay included in the study were collected from the overstay audit files.

Primary reason for overstaying of patients such as diagnostic procedures, healthcare acquired infections, medical problem, and socioeconomic factors were identified.

Case records of these patients were obtained from the medical records section of PCMC. Verification of data gathered from the overstaying audit was done and other information of patient such as final hospital days, discharge diagnosis, presence of co-morbidities, and treatment outcome were collected. Data were encoded accordingly. In our study, the collected data were presented as frequency (f) or percentage (%) as appropriate.

Descriptive statistics were used to summarize the clinicodemographic profile of the study population using counts and percentages for categorical variables. Prevalence of prolonged length of stay was also determined by dividing the total number of admissions from January 2023 to December 2023 by the patients who are considered to have prolonged length of stay.

Ethical considerations are crucial, particularly when human participation is involved. They guarantee that moral standards are followed to safeguard participants' rights during the course of the study. No other forms of intervention were used during the research process and patient records were the only source of data. The principal investigator has a strong commitment to ethical principles that safeguard patient privacy, maintain confidentiality, and show the utmost respect

for research participants. The study's information was only used to further the investigation. The identities of the participants were also protected. This study only utilized patient records for the purpose of this research and did not involve any direct human participation. The hospital's consent for admission served as the informed consent to engage voluntarily in this research study. All identities of the patients were protected in accordance with the data privacy act. The data collected were stored in an encrypted folder which was only accessible only to the investigators and statistician. All data collected will be deleted from the device memories after the study has been concluded.

RESULTS

The dataset for this study comprises a total of 153 patients with prolonged length of stay out of the 2104 admissions from services involved in this study which were recorded from January 2023 to December 2023. The prevalence of prolonged length of stay for the given study period is 7.27%. Table 1 shows the clinicodemographic profile of patients included in our study. The patients were divided in 4 age groups: infants (≤ 1 year), toddlers (2 years old), children (3-9 years old) and adolescents (≥ 10 years old). Among the 153 patients, 67 (43.79%) were classified as adolescents, 40 (26.15%) were children aged 3-9 years old, 39 (25.49%) were infants, and 7 (4.57%) were toddlers. Seventy-eight (78) of the patients (50.9%) were female with the other 75 patients (49.00%) being male.

Among the 25 different areas from where the patients reside, most of the patients with prolonged length of stay were from Quezon City comprising 26.79% of the patients. Around 15.68% were from Rizal and 12.41% were from Bulacan.

Majority of the patients presented with comorbidities comprising 93.46% of the population while only 6.54% of the patients had no comorbidities.

Table 1. Clinicodemographic Profile of Patients with Prolonged Length of Stay from January 2023 to December 2023

	Demographic Parameters	Frequency (n)	Percent (%)
Age	1 month – 1 year	39	25.49
	2 years old	7	4.57
	3 – 9 years	40	26.15
	>10 years	67	43.79
Sex	Male	75	49.00
	Female	78	50.98
Area of Residence	Bulacan	19	12.41
	Cagayan	1	0.65
	Caloocan City	17	11.11
	Cavite	8	5.22
	Isabela City	1	0.65
	Laguna	9	5.88
	Las Pinas City	2	1.31
	Makati City	3	1.96
	Mandaluyong City	1	0.65
	Manila	5	3.27
	Marikina	2	1.31
	Masbate	1	0.65
	Muntinlupa City	4	2.61
	Oriental Mindoro	1	0.65
	Pangasinan	2	1.31
	Paranaque	2	1.31
	Pasay City	1	0.65
	Quezon City	41	26.79
	Rizal	24	15.69
	Taguig City	1	0.65
	Tarlac	1	0.65
	Valenzuela City	4	2.61
	Demographic Parameters	Frequency (n)	Percent (%)
Comorbidities	Present	143	93.46
	None	10	6.54

Different age groups of patients with prolonged length of stay and their diagnosis are presented in Table 2. Adolescents accounted for majority of the admissions (43.79%), with most of these admissions being due to neurologic conditions. Forty (26.14%) of the admissions comprised of children aged 3-9 years old and 39 (25.49%) were children aged 1 month to 1 year old.

In adolescents aged 10-18 years old, diseases of the nervous system were the most common diagnoses followed by infectious diseases and respiratory diseases. In children

aged 3-9 years old, majority of diagnoses were also due to neurologic conditions and infectious diseases but these were followed by renal diseases. In children aged 1-2 years old, most common diagnoses were diseases of the respiratory system.

In total, diseases of the nervous system were responsible for the most of admissions (35.29%) which was followed by infectious diseases (25.49%). Both respiratory and renal diseases comprised 10.46% of admissions with prolonged length of stay and 5.23% was because of surgical conditions.

Table 2. Age groups and diagnosis of patients with prolonged length of stay from January 2023 to December 2023.

Diagnosis	Infant	Toddler	Childhood	Adolescent	Total
Bacterial or Viral Infections	14	3	13	9	39 (25.49%)
Cardiovascular condition	2			2	4 (2.61%)
Diseases of the Central Nervous System	8	1	14	31	54 (35.29%)
Disease of the Gastrointestinal System	2	1	1	3	7 (4.58%)
Disease of the Immune System	1		1		2 (1.31%)
Diseases of the Respiratory System	4	1	3	8	16 (10.46%)
Endocrine disease				1	1 (0.65%)
Genetic Disorder	1				1 (0.65%)
Hematologic and Oncologic Disease			2	2	4 (2.61%)
Renal Disease	1	1	4	10	16 (10.46%)
Rheumatologic Disease	1				1 (0.65%)
Surgical Condition	5		2	1	8 (5.23%)
TOTAL	39 (25.49%)	7 (4.58%)	40 (26.14%)	67 (43.79%)	153

Of the different reasons for patient's prolonged length of stay as shown in Figure 1, 140 (91.50%) were due to medical problems while 8 (5.22%) were due to healthcare associated infection. Three (3) patients (1.96%) had a prolonged length of stay due to diagnostic procedures and only 2 (1.31%) were due to socioeconomic factors. Medical problems included medical therapy, procedures, and titration of oxygen support. Healthcare associated infections such as

pneumonia and urinary tract infection were noted to be reasons for patient's prolonged length of stay as well as diagnostic procedures not available at our institution such as urine vanillylmandelic acid test and cranial medical resonance imaging which required processing outside our institution. Difficulty procuring materials for home ventilation as well as preparation of caregivers at home were socioeconomic factors identified for delayed discharge.

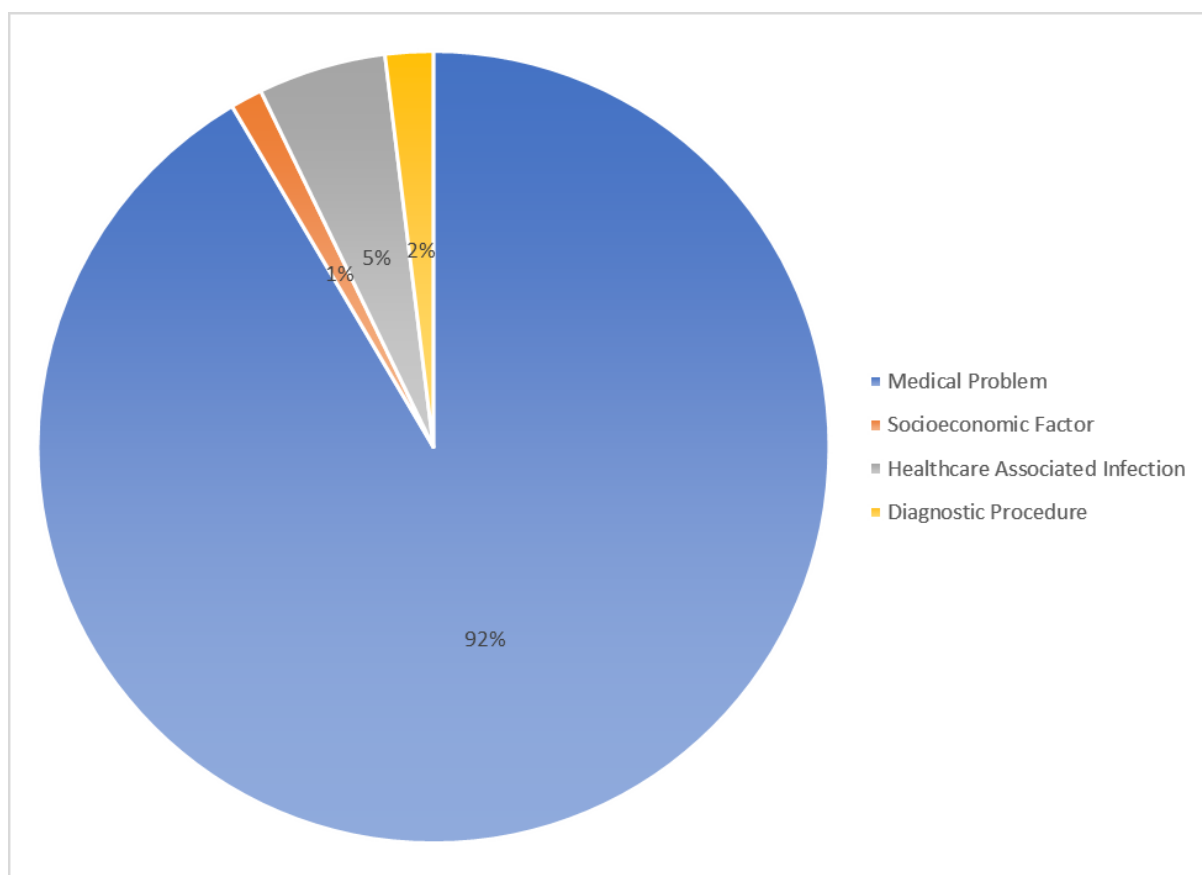


Figure. Reasons for prolonged length of stay of patients

The clinical outcomes of patients were identified from their inpatient records. 94.36% of the patients were discharged well and improved whereas death occurred in 6.54%.

DISCUSSION

The length of a patient's stay in the hospital is one of the useful indicators that may be used to manage hospital care, quality control, availability of hospital services, hospital policy and planning, as well as assess the effectiveness and utilization of hospital resources. [1]

Prolonged length of hospital stay may indicate poor quality of care and inefficient hospital processes leading to delays in recovery time and needing additional care and treatment. [2]

In 2023, the prevalence of prolonged length of stay at PCMC is 7.27% which is only slightly lower than that of other studies [4]. This result supports the role of PCMC as a referral center for patients with the most complicated diseases coming from different areas of residences and committed to continuously providing multidisciplinary care.

In a study by Schneuer et. al, females and children aged 12 years and older had a higher rate of longer stays. [3] A similar trend was observed in our study wherein there was a slight female predominance (50.9%) of patients who have prolonged length of stay and majority of these admissions were also adolescents (43.79%) aged 10 years and above. In our study, children 3 to 9 years old made up 40% of the admissions, while children 1 month to 1 year old made up 39.00%. In the same study by Schneuer et.

al, children from the most disadvantaged areas had a slightly (4.00%) higher proportion of longer hospital admissions compared with those from least disadvantaged areas. However, results from our study showed that majority of the patients with prolonged length of stay were from the least disadvantaged area, Quezon City (26.79%) among other cities. Residents from Quezon City, despite having one of the most equipped and empowered healthcare sector in the country, may have contributed to majority of the overstaying patients because of the complicated nature of disease of the affected patients which may need subspecialty referrals that primary care centers are not able to address.

A local study conducted by Besa et. al showed that comorbidities of a patient were positive predictors of prolonged hospital stay which resulted to a greater number of co-managing subspecialty services leading to a prolonged hospitalization period. [4] Similarly, 93.46% of the population in our study had comorbidities which affected the disease process, while only 6.54% had no comorbidities. These patients presenting with comorbidities tend to develop more complications requiring a prolonged treatment, evaluation, and care. Having the benefit of multidisciplinary care in our hospital, patients with comorbidities tend to have several comanaging subspecialty services on board to provide a holistic treatment for the patient. This may also entail a more complex treatment process required for the patient to address

different areas of concern during the hospital stay. Although the main service is in charge of a patient in making the ultimate decisions based on input from other services, conflicting opinions between services can sometimes result in delays in patient care, ultimately extending their hospital stay.

In the Western Pacific region, Schnerer et. al identified mental and behavioural disorders such as eating disorders, depressive episodes, and anxiety disorders as the top three primary individual diagnoses of lengthy hospital stays in children aged 12 to 15 years, whereas neoplasms were the most common reasons for prolonged hospital stay in younger age groups followed by endocrine, nutritional and metabolic diseases, musculoskeletal, and mental and behavioural disorders. [3] In our setting, the majority of prolonged hospital stay was also made by adolescents (44.44%) and this was due to neurologic conditions such as encephalitis and ventriculitis requiring prolonged treatment. For children between the ages of 3 and 9 years old, neurological disorders and infectious diseases contributed to majority of the prolonged length of stay. In children aged 1-2 years old, most common diagnoses were diseases of the respiratory system. Among all age groups, nervous system disorders accounted for the majority of admissions (35.29%), with infectious diseases coming in second (25.49%). Both respiratory and renal diseases comprised 10.46% of admissions with prolonged length of stay and 5.23% was

because of surgical conditions.

Reasons contributing to prolonged length of stay of patients include diagnostic procedure, healthcare associated infection, medical problem, and socioeconomic factors. [1,3,4,8] In this study, medical problems (91.50%) played a major role in the prolonged length of stay of patients. Some of the medical problems identified included complexity and chronicity of disease warranting prolonged treatment, difficulty in titration of oxygen support and other therapeutic procedures. Being a tertiary care institution providing multidisciplinary care, most patients were observed to have complicated medical problems and warranted the involvement of different subspecialties in management which may also prolong treatment and lead to longer hospitalization since the complicated nature of the disease processes necessitate further evaluation, care, and management.

Healthcare associated infection and pneumonia comprised 5.22% of patients who primarily had prolonged length of stay requiring additional intravenous antibiotic treatment. Prolonged length of stay of three patients (1.96%) were brought by the need to facilitate several diagnostic procedures to further aid in diagnosis and management of patients prior to discharge. Unavailability of certain diagnostic procedures in the institution and difficulty securing schedules for these procedures have also caused delays in diagnosis, management, and discharge,

thus leading to longer hospitalization. Only two (1.3%) patients' extended hospital stays were resulted by socioeconomic factors like procurement of materials for home care and training of caregiver.

However, despite medical problems being the primary reason for prolonged length of stay of majority of patients, the other reasons identified also later served as adjunct for some patients to further prolong their stay in the institution to be able to provide further management.

Clinicians and hospital administrators can enhance the effectiveness of their facilities and the standard of patient care by being aware of these factors and reasons linked to extended hospital stays and causes of delayed discharges. These findings may help formulate plans for faster bed turnover and healthcare staffing.

While 94.36% (n=143) of the patients were discharged well and improved, 6.54% (n=10) of the patients succumbed to death. The deceased patients have been under long term care and their demise was brought by the complexity of the nature of their disease, with some already given poor prognosis during the course of the hospital stay.

CONCLUSION

This retrospective study concludes that patients who have prolonged length of stay are

most commonly adolescents and are most commonly females. Majority of patients were from Quezon City followed patients from Rizal and Bulacan. Compared to other studies, most common diagnoses identified with patients with prolonged length of stay in our institution were neurologic, infectious, respiratory, and renal diseases. Several studies have shown that prolonged length of stay was generally because of medical problems, which was also similar in our study. This may be due to the complexity and chronicity of diseases of patients admitted in our institution. Although the majority of patients' prolonged duration of stay was primarily caused by medical issues, some patients had prolonged length of stay also due to other secondary factors. Furthermore, most of the patients with prolonged length of stay were discharged well and improved. Strengthening of ongoing service delivery network and prompt subspecialty referrals and involvement may be done to address patient's medical needs and problems which may help in reducing their length of stay.

LIMITATIONS OF THE STUDY AND RECOMMENDATIONS

This study examined a cohort of 153 patients over a 1-year period. In this investigation, we discussed patients' age, sex, area of residence, presence of comorbidities, diagnosis, and treatment outcomes of patients.

Noting that majority of patients with prolonged length of stay were due to their medical problems, thorough review of cases to be admitted may help in identifying those that do not require tertiary care and can be referred to secondary or primary institutions instead. Strengthening the ongoing service delivery network may also be done. With the availability of different subspecialties in our institution, prompt referral and constant communication with subspecialty services involved remain crucial in the decision making for patients' management and addressing patient needs. Multidisciplinary involvement may prevent further complications of the disease and prevent prolonged hospital stay. Since some of those patients who tend to overstay are also known patients to different services or subspecialties, close follow up monitoring and guidance for these chronically ill patients may be done even at the outpatient department to prevent future hospital readmissions and prolonged length of stay. The introduction of programs and initiatives to lower length of stay and enhance bed availability in the hospital system can be guided by these findings. It is also helpful to note of certain diseases requiring admission and prolonged treatment such as encephalitis, which is usually more common during warmer months, so that the administration may prepare for bed allocations of other patients admitted under the same service. For future research, we suggest expanding the review period to encompass a larger study population.

We propose that future research should also consider further examining the different factors contributing to overstay of patients such as medical problems, healthcare associated infections, and diagnostic procedures, and socioeconomic factors and their association with one another. This may aid in strategic planning of hospitals for the efficient utilization of hospital resources, bed allotments, reduction of costs to the healthcare system and better addressing the needs of patients. Further studies may also contribute in training and supporting hospital staff on what actions may be taken not only to reduce patient's length of stay but also to prevent burnout of practitioners caring for overstay patients. In addition, further studies may also impact and improve children's health, wellbeing, and quality of life during hospital stay and upon discharge as well as cater to parents' concerns with regards to prolonged length of stay.

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