

Cost-Effectiveness Analysis of Long Peripheral Catheters Compared With Peripherally Inserted Central Catheters

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BACKGROUND

The use of long peripheral catheters (LPCs) as a first-line option in patients requiring therapies suitable for peripheral administration and with a DIVA score ≥ 4 is limited, primarily due to cost considerations. Although the service provides peripherally inserted central catheters (PICCs), which are associated with higher costs, there is a technological gap between short peripheral catheters (SPCs) and PICCs. The absence of LPCs as an intermediate option may lead to less accurate catheter selection by nurses and negatively impact hospital daily costs.

OBJECTIVE

To evaluate the cost-effectiveness of PICCs compared with LPCs, aiming to support the inclusion of this technology as an alternative vascular access option

METHODS

Prospective cohort study with an economic analysis of the direct costs of long peripheral catheter and peripherally inserted central catheter procedures in the pediatric population of a university hospital

RESULTS

Variable		Total (n = 254)	LPC (n = 94)	PICC (n = 160)	p-value
Age (years), mean $\pm$ SD	—		74.1 $\pm$ 61.7	59.0 $\pm$ 56.9	0.009
Sex, n (%)					—
Male	138 (54.3%)		—	—	
Female	116 (45.7%)		—	—	
Race/Ethnicity, n (%)					—
White	187 (73.6%)		—	—	
Black	67 (26.4%)		—	—	
Catheter dwell time (days), mean $\pm$ SD	—		13.4 $\pm$ 14.5	16.5 $\pm$ 13.2	0.002
Insertion time (min), mean $\pm$ SD	—		26.2 $\pm$ 4.6	54.4 $\pm$ 21.1	<0.001

Clinical Characteristics, Indications, and Outcomes of Vascular Access Devices

Figure 1. Summary of patient clinical characteristics and vascular access indications, emphasizing the high prevalence of complex conditions and difficult intravenous access.

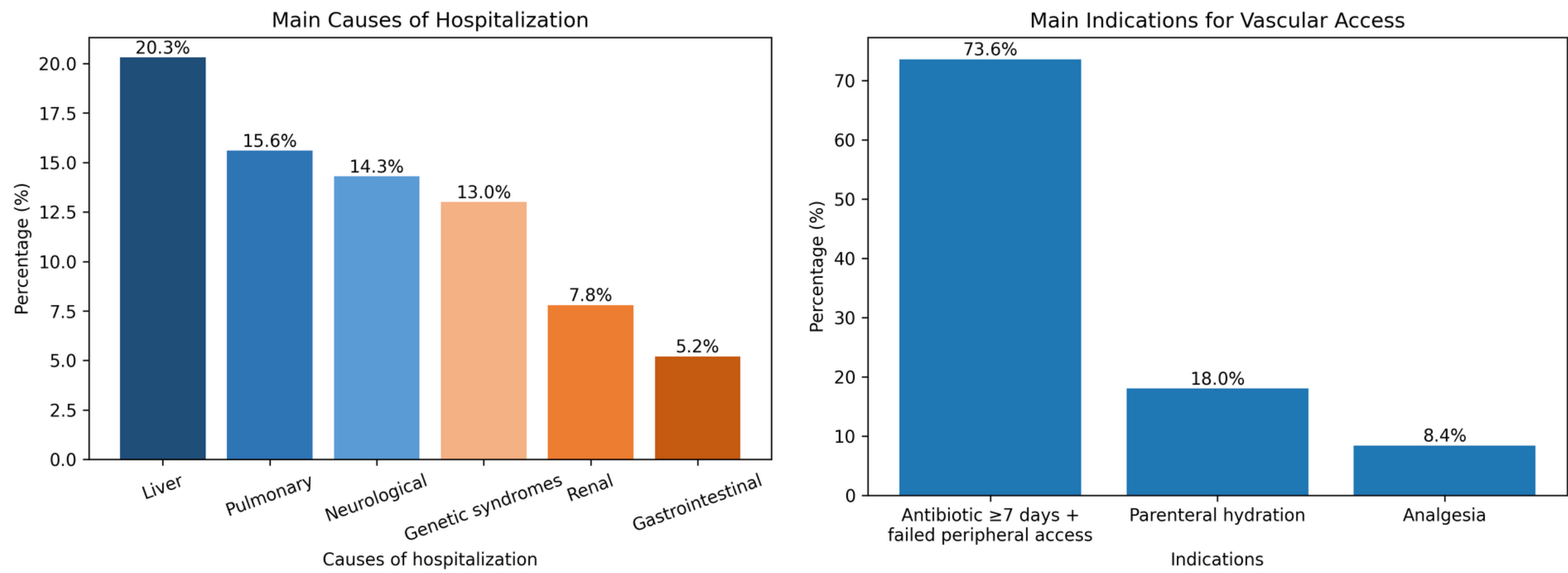
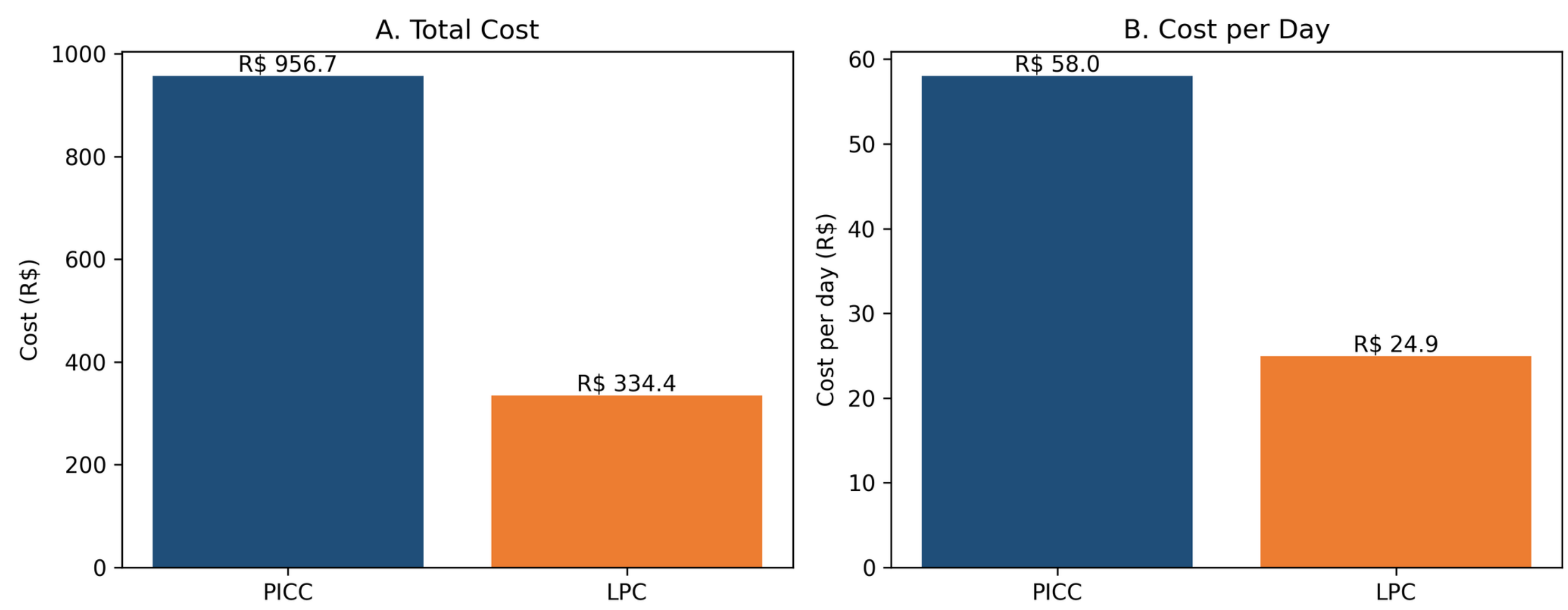


Figure 2 Cost analysis of vascular access devices. (A) Total insertion cost was higher for PICCs compared to LPCs. (B) Cost per day of catheter use remained higher in the PICC group despite longer dwell time



Catheter dwell time was longer for PICCs (16.5 $\pm$ 13.2 days) compared to LPCs (13.4 $\pm$ 14.5 days; p = 0.002). Insertion time was greater for PICCs (54.4 $\pm$ 21.1 minutes) compared to LPCs (26.2 $\pm$ 4.6 minutes; p < 0.001).

Figure 3. Comparison of device-related complications between PICC and LPC groups.

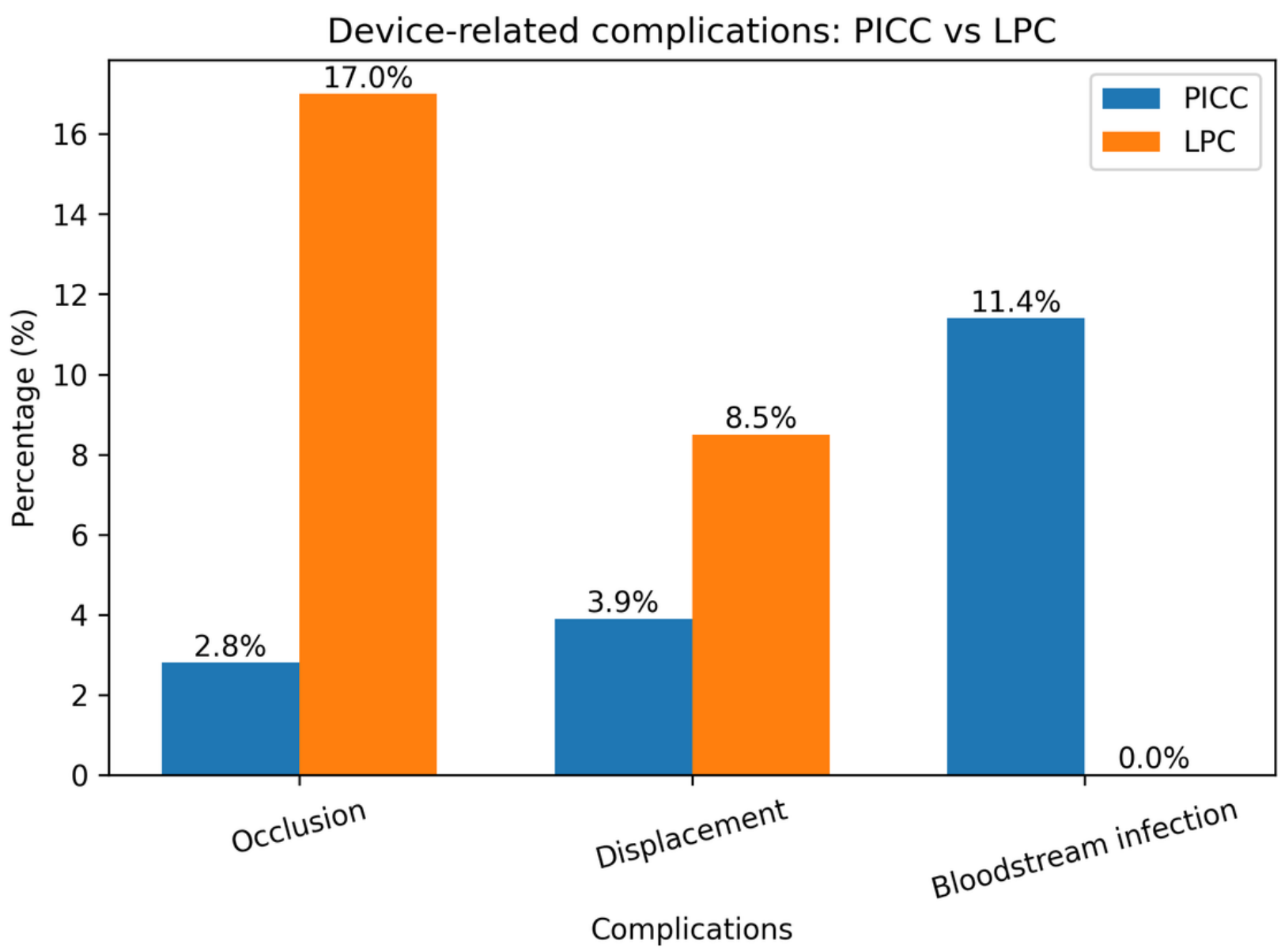
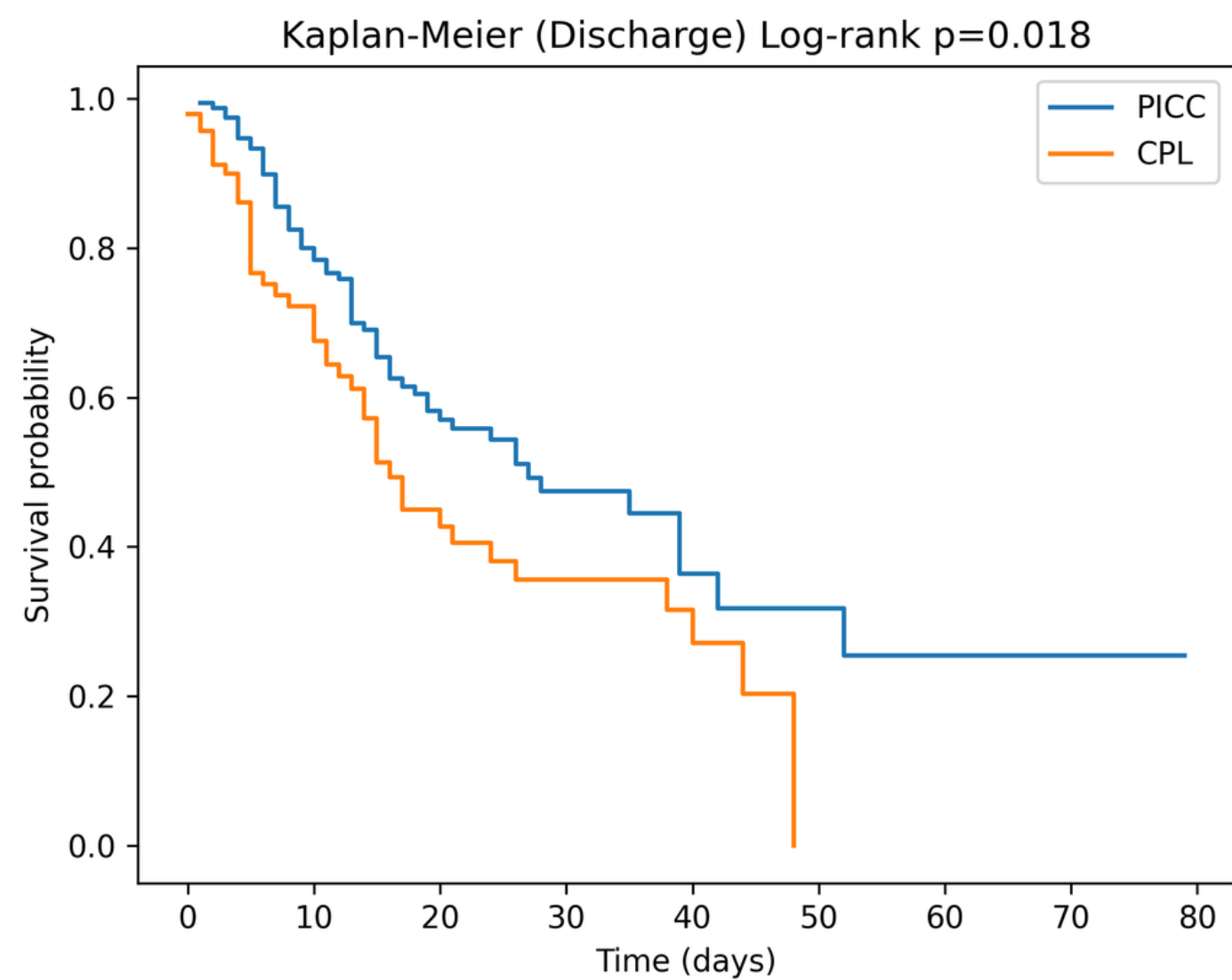
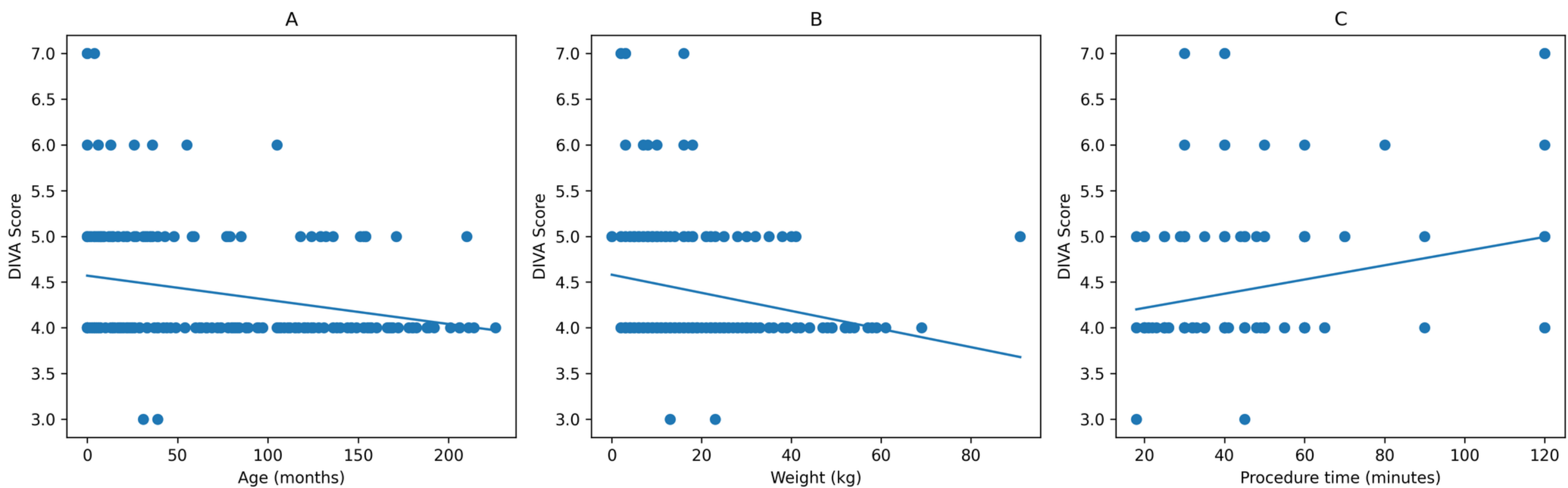


Figure 4. Kaplan–Meier survival analysis was performed to compare time to catheter removal due to hospital discharge between PICC and LPC groups



Pearson correlation analysis demonstrated significant negative associations between age and DIVA score (r = -0.260 ; p < 0.001), body weight and DIVA score (r = -0.237 ; p < 0.001), and procedure time and DIVA score (r = -0.249 ; p < 0.001). These relationships are illustrated in Figure X, showing consistent inverse linear trends across all variables.

Figure 5. Pearson correlation analysis between clinical variables and DIVA score



CONCLUSION

LPCs proved to be a viable and cost-effective alternative for pediatric patients receiving short- and medium-term therapies suitable for peripheral administration. These findings highlight the importance of expanding access to LPCs as an intermediate vascular access technology

