Differences in management and PICU admission of children visiting the emergency department in Europe during out-of-office hours compared to office hours: an observational cohort study

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What This Study Adds It is important that adequate pediatric emergency care at the ED is provided both during office and out-of-office hours. Little is known about differences in patient characteristics, management and PICU admission of children visiting the ED during out-of-office hours and office hours.

Aim To address differences in the management and Pediatric Intensive Care Unit (PICU) admission of children visiting the Emergency Department (ED) during out-of-office hours compared to office hours.

Methods This was an observational cohort study at 5 ED's in 4 European countries (The Netherlands, United Kingdom, Portugal, Austria). Analyses were made comparing office hours and out-of-office hours; specific analyses were made comparing office hours to weekend day shifts, evening shifts and night shifts.

Results 119.204 children were included. Patients presenting at night were younger (median age 4.2 years versus 4.8 years during office hours), more often classified as emergent/very urgent (15.8% versus 9.7% during office hours) and more often had ≥ 2 abnormal vital signs (22.8% versus 18.1%), compared to office hours.

After correcting for patient characteristics and disease severity, laboratory and radiologic tests were less likely to be requested, therapy was more likely to be given during out-of-office hours and patients were more likely to be admitted to the general ward at night. In univariate analysis, children were more likely to be admitted to the PICU during the night, however, after correcting for disease severity no association was found between PICU admission and time of ED visit.

Conclusion Children that visited during the night appeared to be more ill than during office hours. Management, including diagnostic tests, therapy and admission to the general ward, was different during the night, after correcting for illness severity and patient characteristics. However, PICU admission was not associated with time of visit.

Table 1. Association between lab / imaging / therapy / hospital admission / PICU admission and time of arrival, multivariate regression analyses

		Office hours ^b	Out-of-office hours	Day shift weekend	Evening shift	Night shift
Lab	Adj. OR ^a	-	0.83	0.87	0.79	0.89
	95% CI	-	(0.81 – 0.86)	(0.83 – 0.91)	(0.76 – 0.82)	(0.85 – 0.94)
	P-Value	-	<0.001*	<0.001*	<0.001*	<0.001*
Imaging	Adj. OR ^a	-	0.86	0.94	0.89	0.67
	95% CI	-	(0.83 – 0.89)	(0.90 – 0.99)	(0.86 – 0.92)	(0.63 – 0.71)
	P-Value	-	<0.001*	0.017*	<0.001*	<0.001*
Therapy	Adj. OR ^a	-	1.20	1.13	1.07	1.67
	95% CI	-	(1.17 – 1.24)	(1.08 – 1.18)	(1.04 – 1.11)	(1.60 – 1.75)
	P-Value	-	<0.001*	<0.001*	<0.001*	<0.001*
Hospital admission	Adj. OR ^a	-	1.10	1.03	0.98	1.39
	95% CI	-	(1.06 – 1.15)	(0.96 – 1.09)	(0.93 – 1.03)	(1.31 – 1.49)
	P-Value	-	<0.001*	0.670	0.142	<0.001*
PICU admission	Adj. OR ^a	-	1.11	1.16	1.14	0.98
	95% CI	-	(0.93 – 1.30)	(0.90 – 1.48)	(0.94 – 1.40)	(0.76 – 1.27)
	P-Value	-	0.248	0.249	0.185	0.894

^aAdjusted for age, gender, MTS urgency, vital signs, setting and flowchart (medical/trauma)

^bOffice hours as reference shift.