

Epidemiology of « organ support-free days » (OSFD) in the PICU of CHU Sainte-Justine: a preliminary study for the OpTTICCA trial



INTRODUCTION

- For a long time, mortality rate in the ICU was used as a primary outcome in RCT because it is hard data, easy to recognize and cannot be rigged.
- The mortality rate in critically ill children is currently so low that it would take tens of thousands of children to detect a statistically significant difference in RCTs
- In order to find a solution to this issue, many types of outcome modalities have been created: PELOD-2, P-SOFA and many more
- What should be the first-choice primary outcome measure of RCT in the PICU is then a matter of debate

OBJECTIVES

- Aim #1 : To create a new outcome score that we named “Organ support-free days”**
- Aim #2 : To determine the epidemiology of OSFD in the PICU of CHU Sainte-Justine.**

METHOD

- Retrospective study using data collected prospectively
- All consecutive patients admitted into the PICU of CHU Sainte-Justine from January 1, 2018, to January 1, 2023, were eligible to participate in the study.
- OSFD is a quantitative indicator corresponding to the number of days hospitalized in the PICU during which the patient **did not require any medical assistance considered as organ support**.
 - [calendar date 29 days post-time zero] – [date when the latest organ support ended]

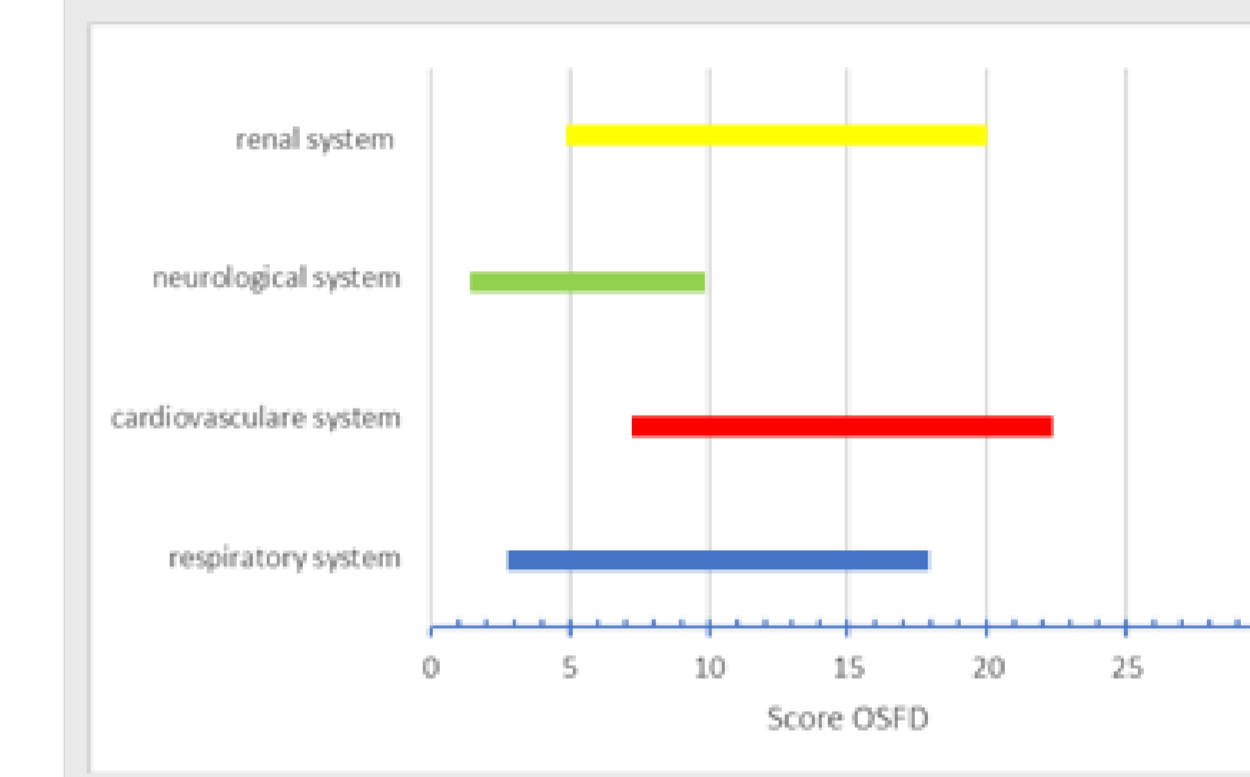


Figure 1. Calculation of OSFD score using the latest date of system support

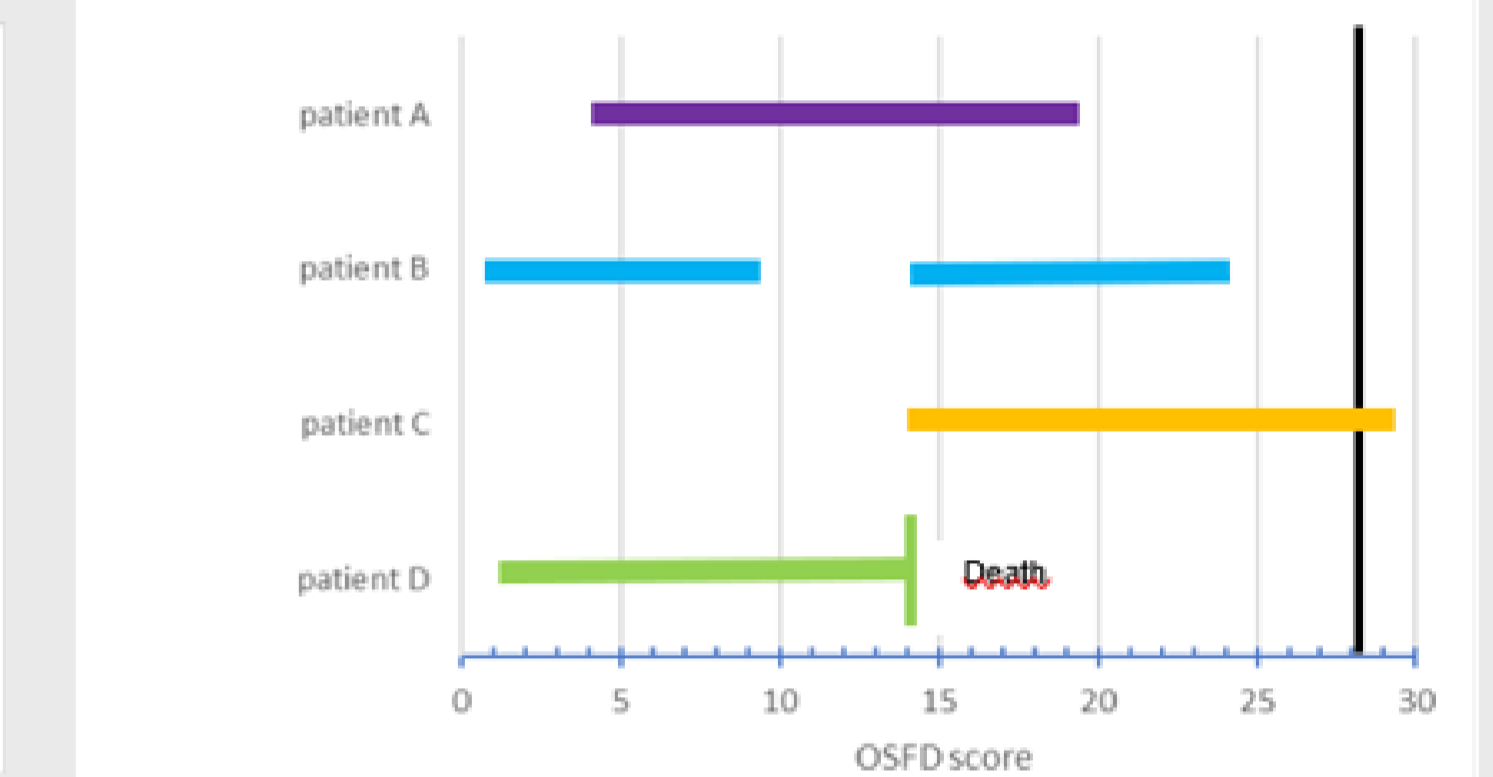


Figure 2. Calculation of OSFD score

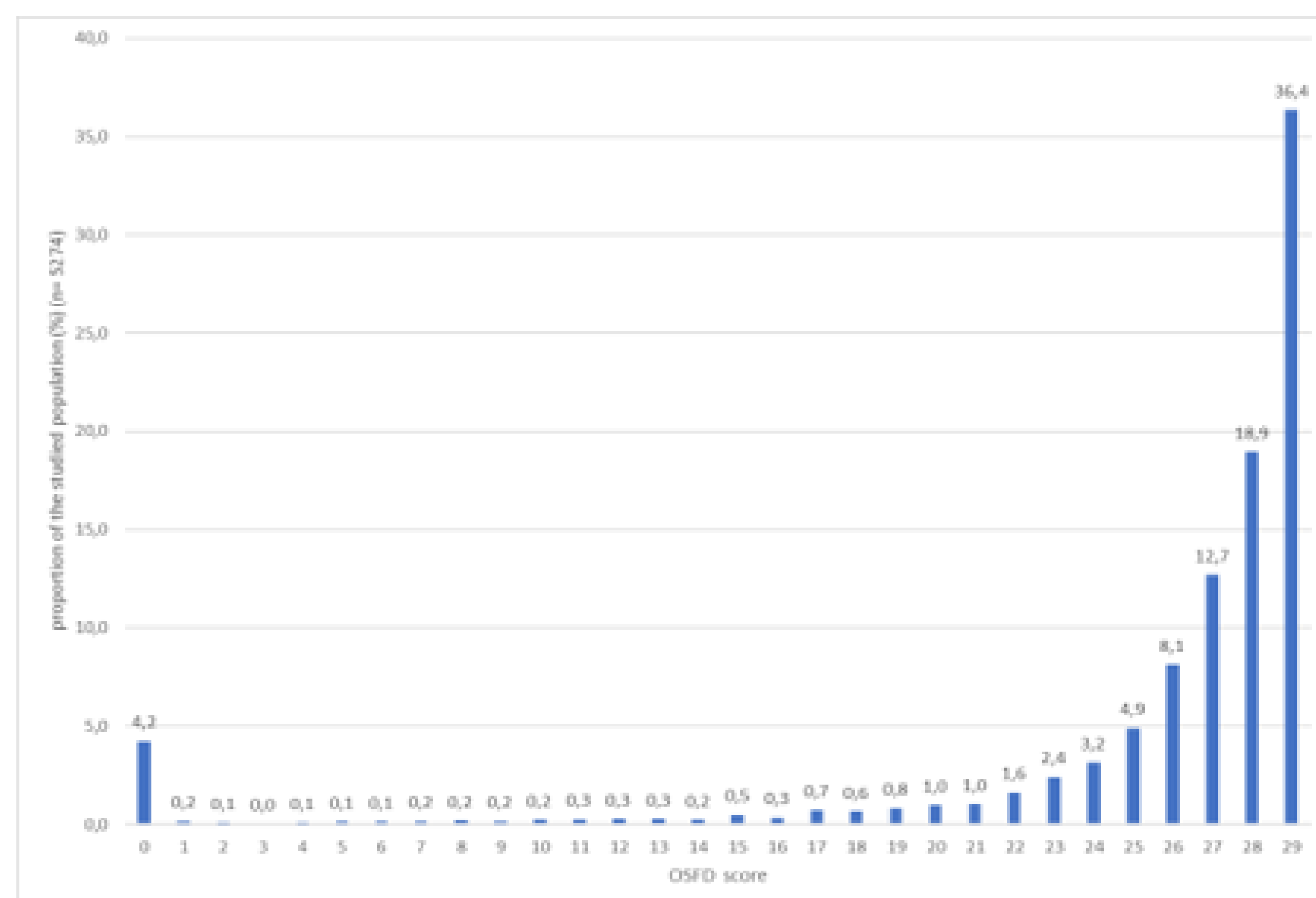


Figure 3. Distribution of OSFD score of 5274 patients admitted in the PICU of St-Justine Hospital from 2018 to 2023. Numbers above bars indicate the percentage of patients having the associated OSFD score.

Table 1. Number of observations of organ support by type of intervention

Intervention	Number of observations	Median (IQR)
Respiration	1171	11.1 (1.1)
Support	1171	11.1 (1.1)
High-flow nasal cannula	1171	11.1 (1.1)
Continuous positive airway pressure	1171	11.1 (1.1)
Cardiorespiratory support	1171	11.1 (1.1)
Cardiovascular support	1171	11.1 (1.1)
Neurological support	1171	11.1 (1.1)
Renal support	1171	11.1 (1.1)
Other	1171	11.1 (1.1)

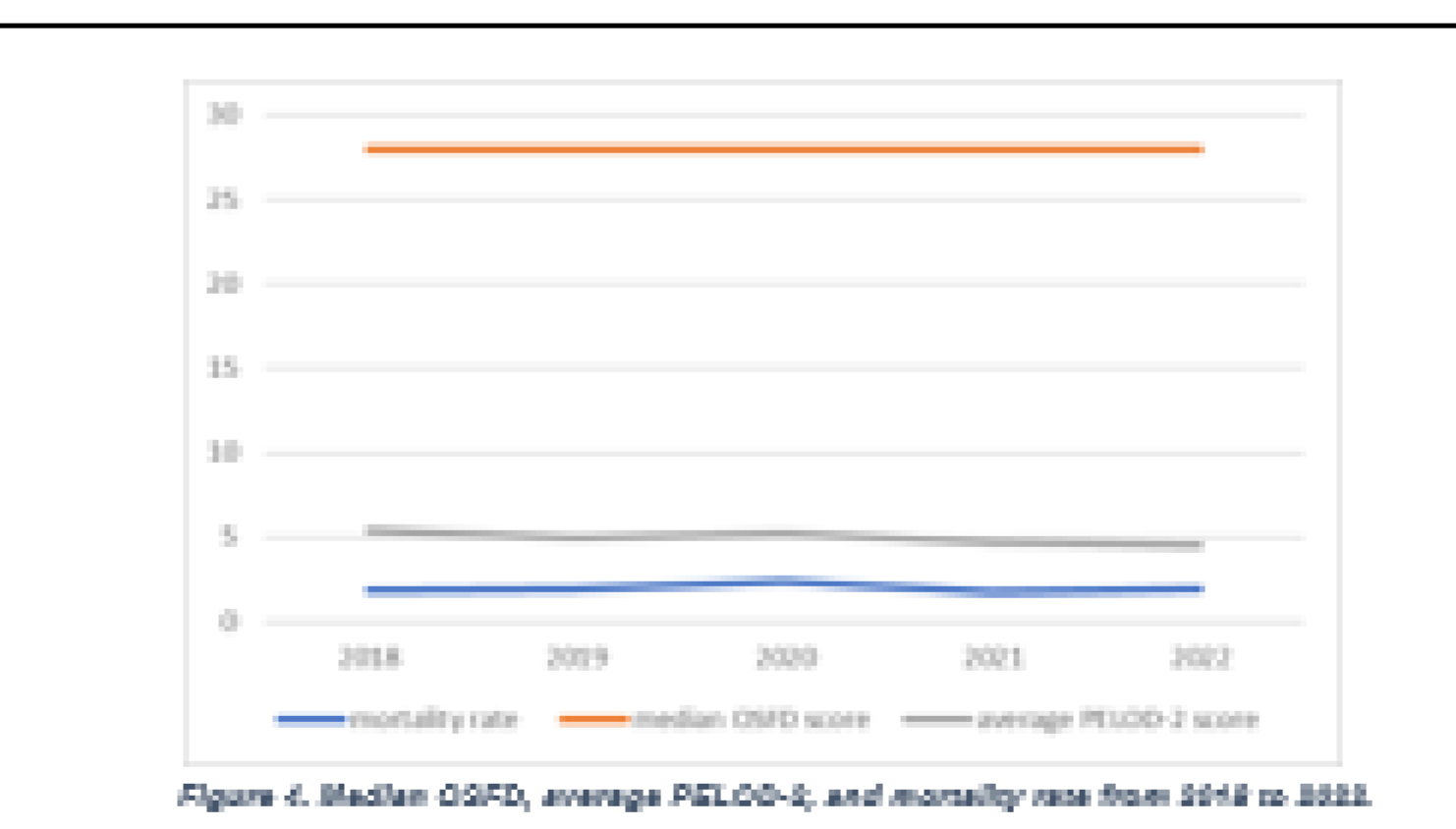


Figure 4. Median OSFD, average PELOD-2, and mortality rate from 2018 to 2022.

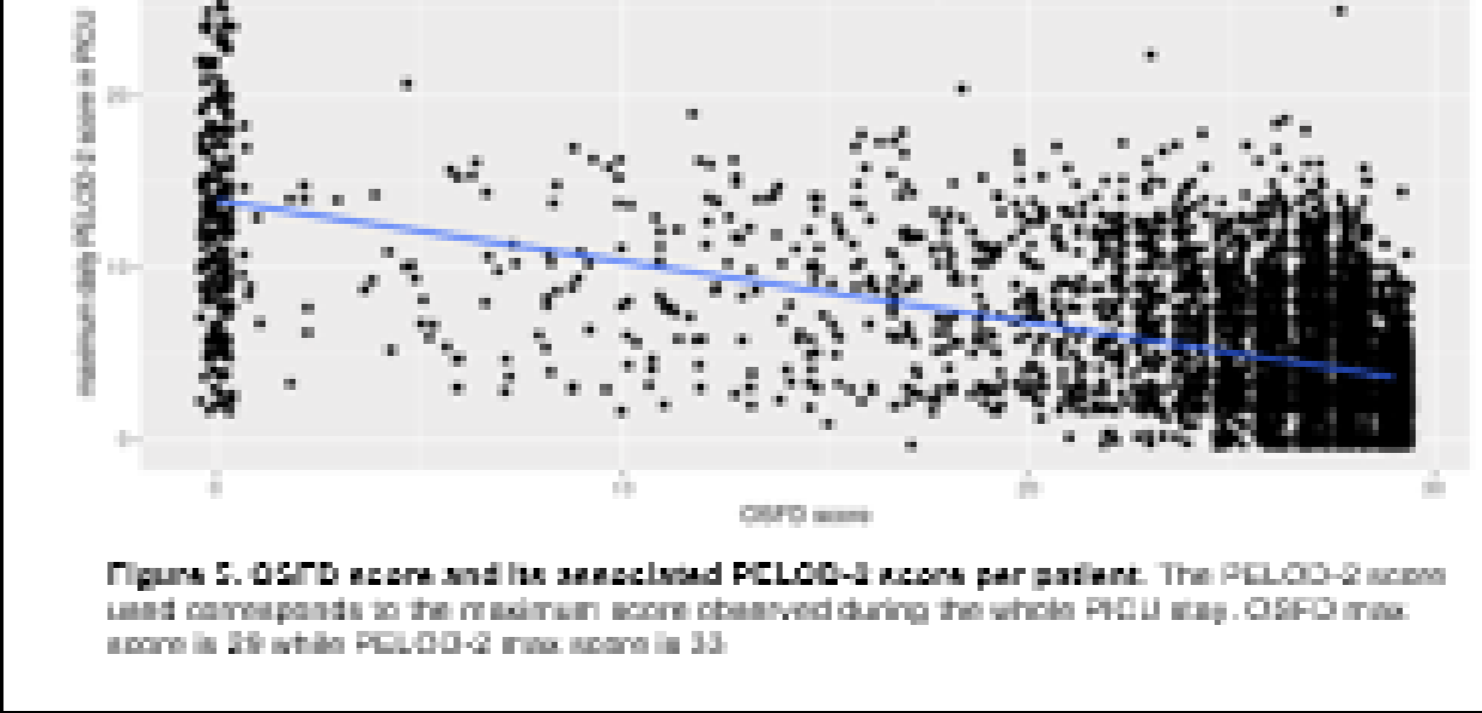


Figure 5. OSFD score and its associated PELOD-2 score per patient. The PELOD-2 score used corresponds to the (7) patient score obtained during the whole PICU stay. OSFD max score is 29 within PELOD-2 max score is 33.

CONCLUSION

- | | |
|---|--|
| <p>Strengths</p> <ul style="list-style-type: none"> Quantitative score Patient and clinician oriented Can be used to assess the adequate use of resources | <p>Limitations</p> <ul style="list-style-type: none"> Monocentric Practice dependant Follow up is needed |
|---|--|

The OSFD score is a reproducible, stable, and reliable indicator of intensity of treatment. It shows promising results and could be used as a primary outcome in PICU RCTs.

ACKNOWLEDGEMENTS

Acknowledgments to the Keu Tran family philanthropic fund

REFERENCES

- Heneghan, J.A., et al., Epidemiology of Pediatric Critical Care Admissions in 43 United States Children's Hospitals, 2014-2019. *Pediatr Crit Care Med*, 2022. 23(7): p. 484-492.
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- Woolfall, K., et al., Parents' prioritised outcomes for trials investigating treatments for paediatric severe infection: a qualitative synthesis. *Arch Dis Child*, 2019. 104: p. 1077-82.

AUTHORS

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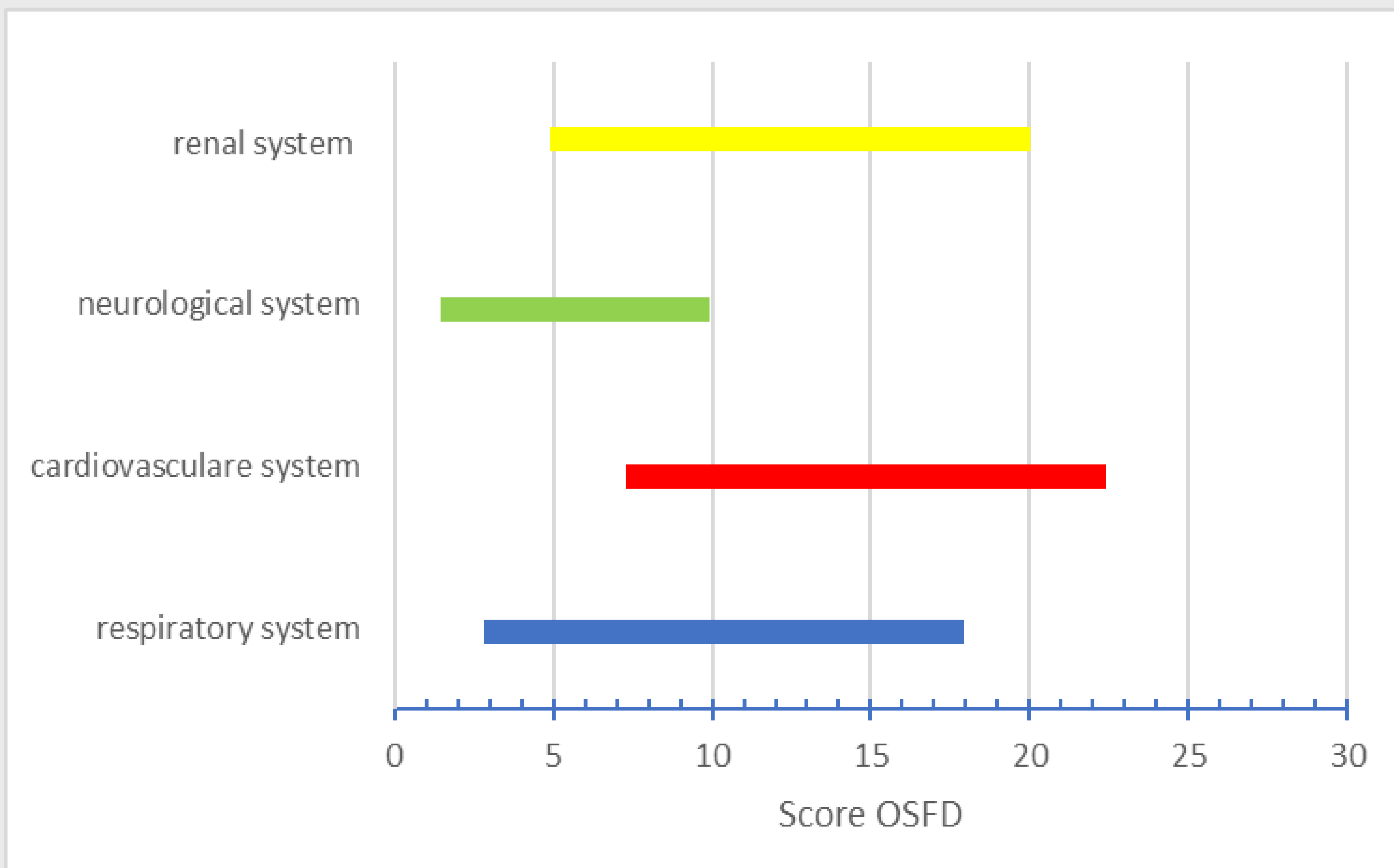


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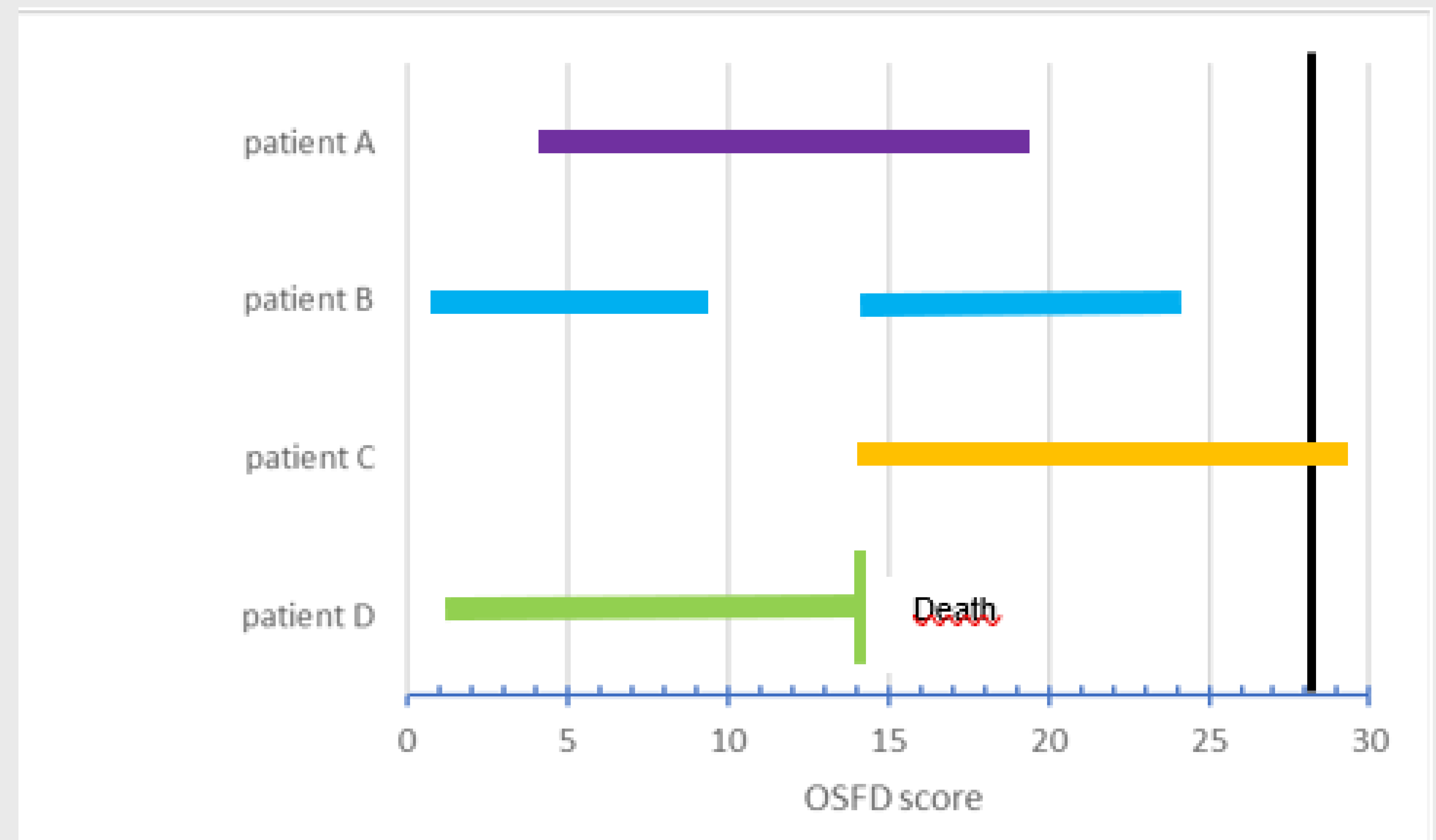


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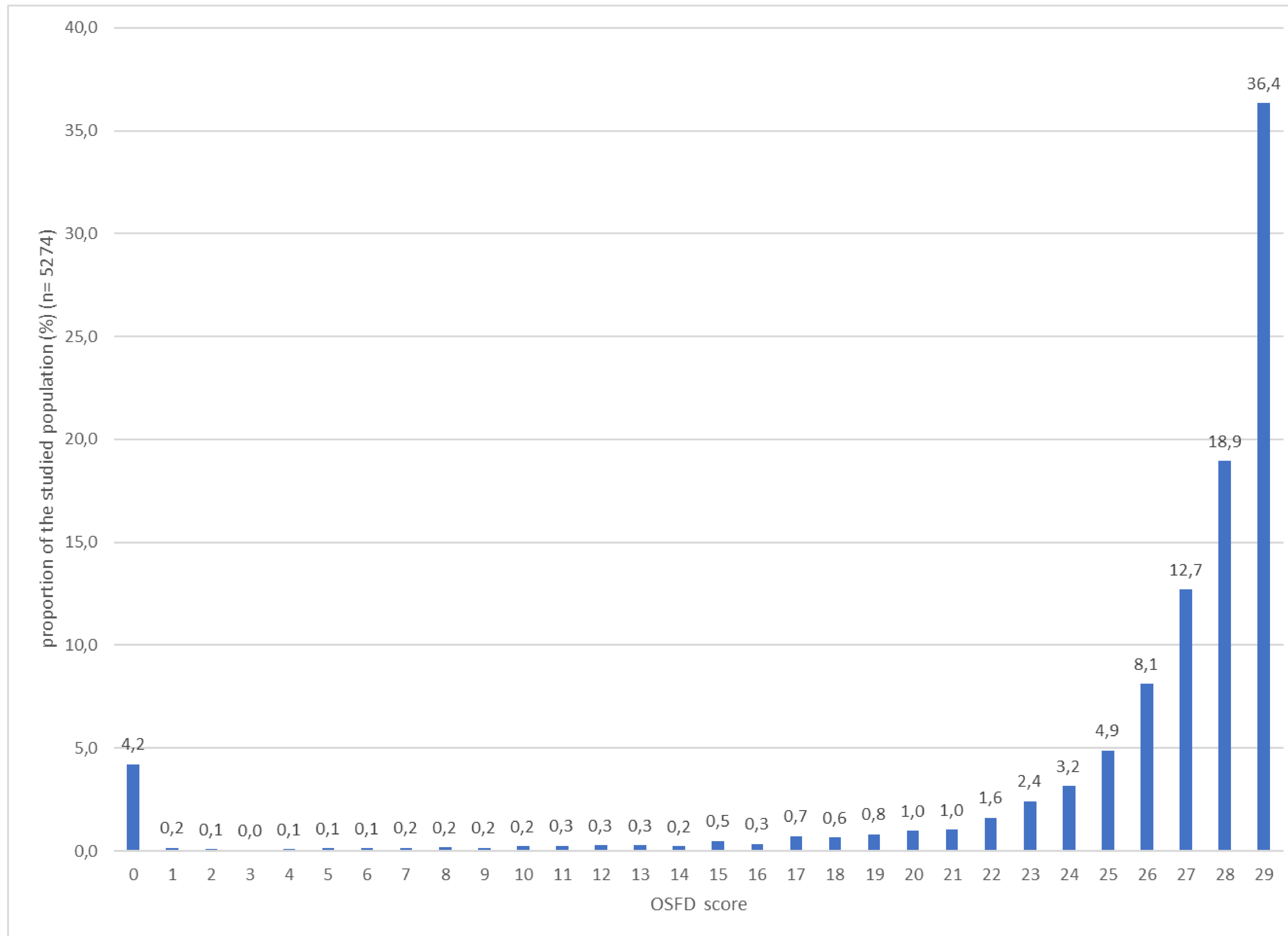


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System support	type of support intervention	observations (n)	n(%)
Respiratory system support	Invasive mechanical ventilation	1771	22,13
	Non-invasive mechanical ventilation	1710	21,37
	High-flow nasal cannula	1275	15,93
Cardiovascular system support	Continuous infusion of salbutamol	170	2,12
	Continuous intravenous infusion of any vasopressor or inotrope	1158	14,47
	Continuous infusion of vasodilator	369	4,61
	Inhaled nitric oxide (iNO)	425	5,31
	Use of ECMO	15	0,19
	Use of a ventricular assist device (VAD)	7	0,09
Neurologic system support	Use of a temporary pacemaker	203	2,54
	hypertonic saline or mannitol to treat intracranial hypertension	151	1,89
	external cerebro-spinal fluid (CSF) drainage to treat intracranial hypertension	71	0,89
	Continuous infusion of an anti-epileptic drug	581	7,26
Renal system support	Continuous infusion of sodium benzoate or sodium phenylbutyrate for severe hyperammonemia	10	0,12
	hemo(dia)filtration, hemodialysis, peritoneal dialysis	86	1,07
total		8002	100,0

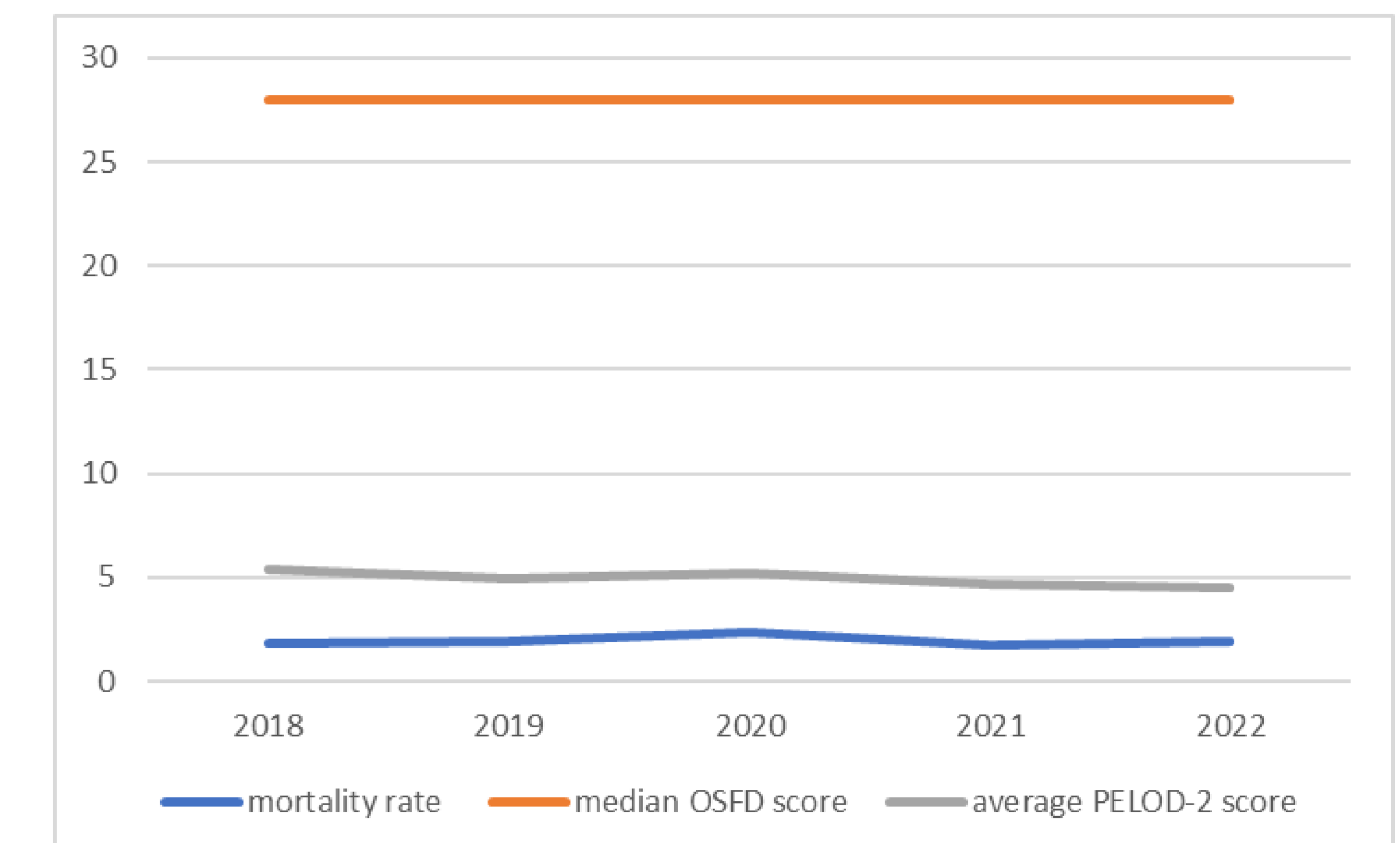


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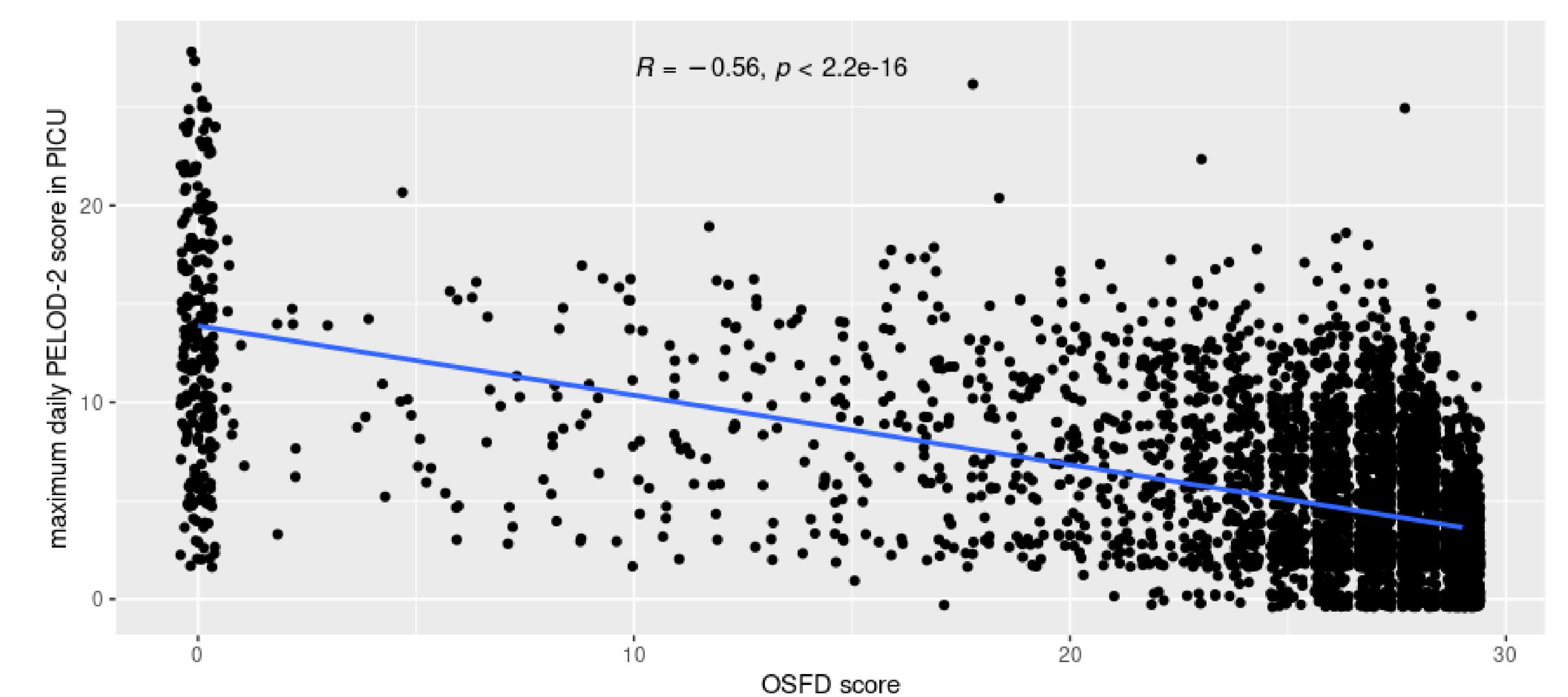


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- Practice dependant
- Follow up is needed

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Can be Vancouver style i.e. 1 Meyer J-P et al. The treatment of high grade superficial bladder cancer and carcinoma in situ with BCG – a questionnaire survey of Consultant practice in England and Wales. Urol Oncol 2002; 2;: 77-80

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