

Is parent-reported quality of life at school age among children born extremely preterm associated with social determinants of health, neonatal morbidities, and developmental outcomes?



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Introduction

- Children born extremely preterm (EPT) are at increased risk of perinatal morbidities (e.g., BPD, ROP, sepsis, and brain injury), as well as exposure to adverse social determinants of health (SDOH) such as maternal education, race/ethnicity, and medical insurance.
- These risks may negatively affect school age development.

Objectives

- HYPOTHESIS:** Children born EPT with a higher number of neonatal medical morbidities and those with more factors related to SDOH would score lower on the Pediatric Quality of Life (PedsQL) scale.
- We postulated that lower scores on the PedsQL subscales would correlate with lower scores on the Wechsler Intelligence Scale for Children-4 (WISC-4) subscales and Woodcock Johnson-III (WJ-III) test of early reading and math.

Methods/Design

- This was a secondary analysis of the SUPPORT Neuro School age follow-up study (Hintz et al Pediatrics 2018).
- Children, born 24+0 to 27+6/7 weeks' gestation, were assessed at 6-7 years with the WISC-4, WJ-III, and PedsQL parent questionnaire.
- T-tests were used to examine differences in mean PedsQL scores by neonatal morbidities and SDOH (Table 1).
- Mixed effects models were fit to examine the relationship between PedsQL scores and developmental test scores after adjusting for neonatal morbidities and SDOH that were significant in the bivariate comparisons. (Figure 1&2).

Results

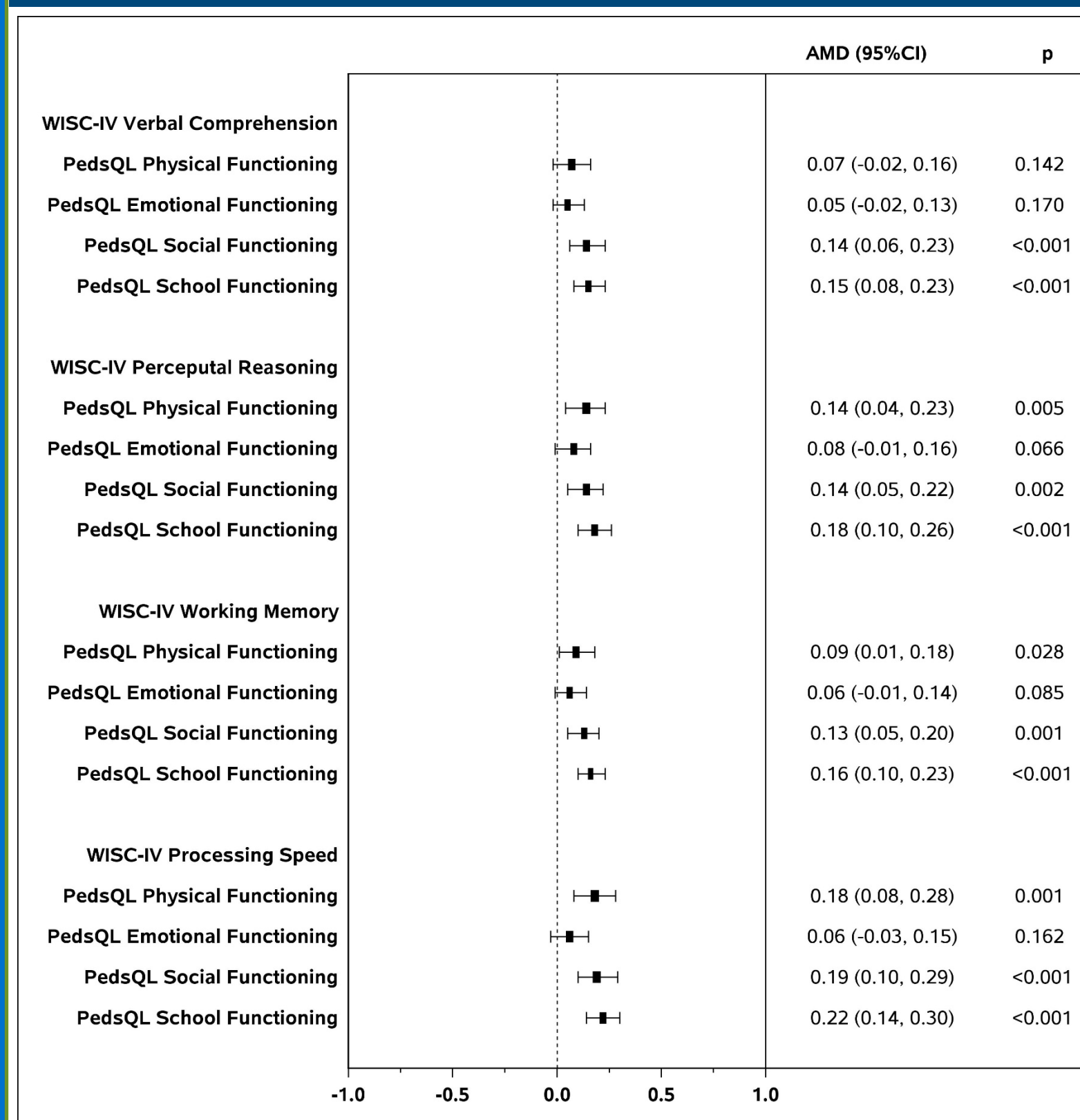
- Perinatal morbidities including ROP, late onset sepsis, early adverse cranial ultrasound (CUS) findings, late CUS adverse findings, and moderate or severe white matter abnormalities (WMA) on MRI were correlated with lower PedsQL physical health scores (Table 1).
- Early CUS adverse findings, late CUS adverse findings, and moderate or severe WMA on MRI were correlated with lower PedsQL social and school functioning subscale scores.
- Of the SDOH factors, children with public or no insurance had lower PedsQL physical health and school functioning scores; children of mothers with < high school education had lower PedsQL school functioning scores. Unexpectedly, White non-Hispanics were rated lower on the PedsQL emotional functioning score (Table 1).
- PedsQL physical health and psychosocial health were positively associated with WISC-IV subscales; and PedsQL psychosocial health was positively associated with WJ-III Letter-Word Identification scores. (Figure 1 & 2). Unexpectedly, WJ-III calculations were inversely correlated with PedsQL emotional functioning score.

Table 1. Mean PedsQL Scores by Neonatal Morbidities and Social Determinants of Health

	Variable	N	PedsQL Scores			
			Physical Functioning M (SD)	Emotional Functioning M (SD)	Social Functioning M (SD)	School Functioning M (SD)
BPD	Yes	142	83.9 (17.0)	72.7 (19.2)	82.5 (18.1)	71.0 (20.9)
	No	261	85.5 (16.3)	75.9 (18.7)	82.4 (18.2)	73.6 (20.5)
Severe ROP	Yes	42	79.9 (21.3)*	71.9 (15.2)	77.3 (19.6)	68.0 (20.9)
	No	337	85.4 (15.9)	74.6 (19.4)	83.0 (18.0)	73.3 (20.1)
Late-onset sepsis	Yes	124	82.5 (18.9)*	72.8 (19.1)	80.4 (18.0)	69.9 (21.9)
	No	279	86.0 (15.4)	75.7 (18.8)	83.4 (18.2)	73.9 (20.0)
Surgical NEC	Yes	14	89.7 (9.8)	71.4 (21.2)	84.3 (18.9)	70.7 (22.6)
	No	389	84.8 (16.8)	74.9 (18.8)	82.4 (18.2)	72.8 (20.6)
Early CUS adverse findings	Yes	35	77.0 (19.4)**	70.4 (16.3)	73.1 (18.9)**	65.9 (21.7)*
	No	367	85.8 (16.0)	75.3 (19.1)	83.4 (17.8)	73.3 (20.5)
Late CUS adverse findings	Yes	24	76.6 (19.3)*	72.7 (17.6)	72.3 (16.7)**	64.4 (18.0)*
	No	379	85.5 (16.3)	74.9 (19.0)	83.1 (18.1)	73.2 (20.7)
Moderate or severe WMA on MRI	Yes	76	81.4 (17.8)*	70.5 (19.9)*	77.6 (17.1)*	69.1 (21.9)
	No	327	85.8 (16.2)	75.8 (18.6)	83.6 (18.2)	73.5 (20.3)
Any cerebellar lesions on MRI	Yes	57	83.0 (17.3)	74.2 (19.9)	80.0 (18.7)	69.0 (21.8)
	No	346	85.3 (16.5)	74.9 (18.7)	82.9 (18.1)	73.3 (20.5)
Maternal education	Less than high school	101	84.1 (15.7)	73.7 (20.9)	83.4 (16.4)	67.0 (21.4)**
	High school or more	296	85.3 (16.7)	75.3 (18.2)	82.3 (18.6)	74.7 (20.1)
Insurance	Public/no insurance	219	83.4 (17.4)*	74.0 (19.9)	83.7 (17.8)	70.3 (21.4)**
	Private	172	87.1 (15.3)	75.4 (17.4)	81.1 (18.7)	76.0 (19.1)
Race/ethnicity	Not White non-Hispanic	238	85.6 (16.3)	77.2 (19.4)**	83.2 (18.0)	72.8 (20.8)
	White non-Hispanic	165	84.0 (17.0)	71.2 (17.6)	81.4 (18.5)	72.6 (20.6)

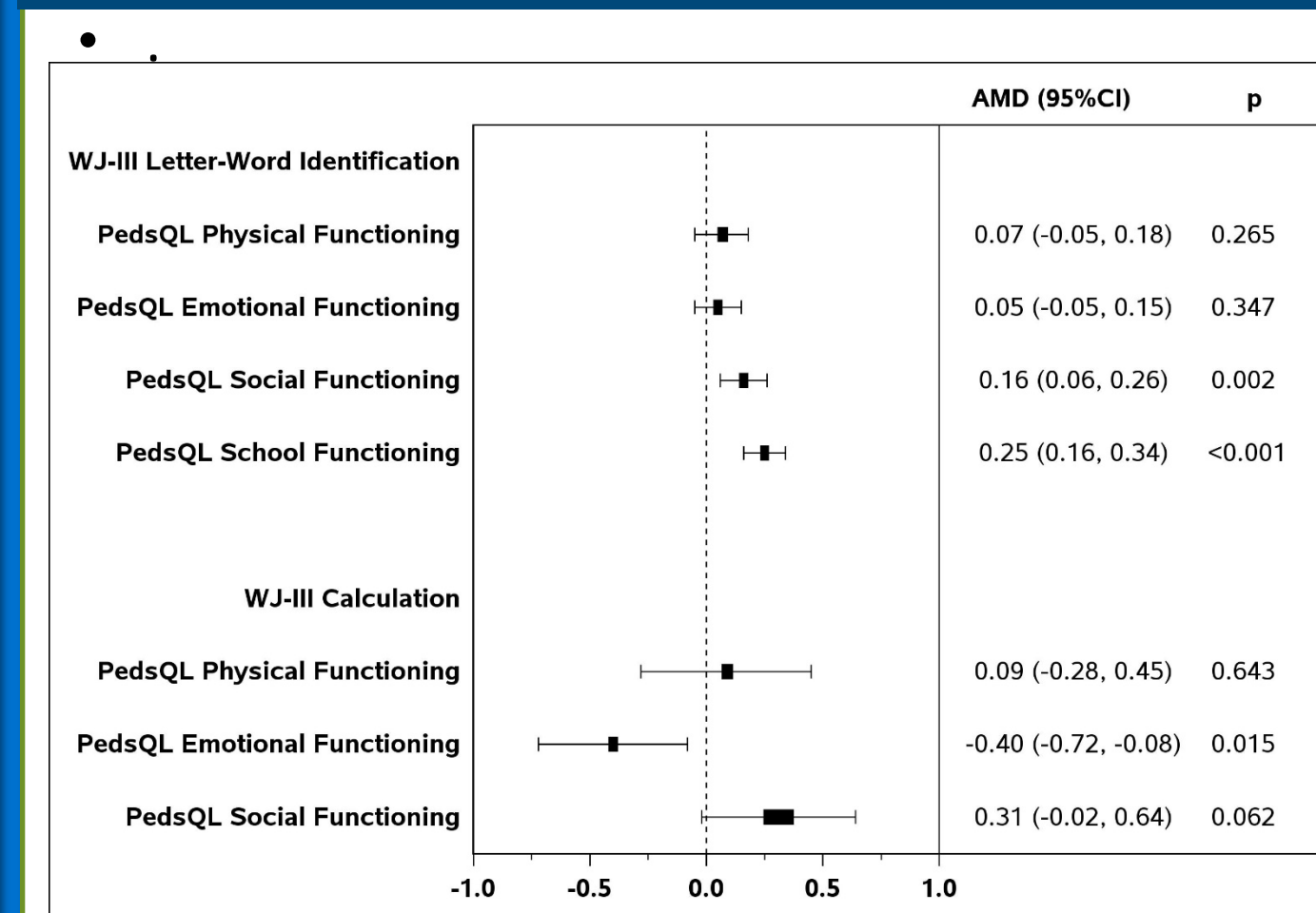
* p < .05, ** p < .01

Figure 1. Adjusted Mean Differences in WISC-IV Scores by PedsQL Scores



Note: Mean differences are adjusted for severe ROP, late-onset sepsis, surgical NEC, early CUS adverse findings, late CUS adverse findings, moderate or severe WMA on MRI, any cerebellar lesions on MRI, less than high school education, public or no insurance, and not White non-Hispanic.

Figure 2. Adjusted Mean Differences in WJ-III Scores by PedsQL Scores



Conclusions

- Parent-reported quality of life for 6 to 7 year old children born EPT in this cohort was significantly associated with perinatal morbidities and neurodevelopmental outcomes at school age.
- Assessing parent reported quality of life in combination with neonatal morbidities and SDOH could improve identification of children at high risk for school age difficulties.

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