

Background

- Concussion is one of the leading causes of morbidity and mortality in children.
- Although many patients recover quickly, symptoms may persist for months to years post-injury.
- Persistent post-concussive symptoms (PCS) have the potential to impact patients' quality of life across various domains: impaired cognition, memory and attention affecting school attendance and performance, mood and social engagement, as well as physical performance.
- There is a clear need to determine the impact of PCS on pediatric quality of life in order to provide a new standard of care focusing on the patient's physical, mental, and social wellbeing.

Objectives

- The primary objective of this study is to evaluate the impact of having PCS at one-month on the QoL in children aged 5 through 17 years of age after suffering a concussion.
- Secondary objectives will be to:
 - Identify independent predictors of decrement in overall QoL, as well as with physical and psychological QoL subsets.
 - Evaluate the natural progression of QoL from 1 to 3 months post-injury and associated factors.

Methods

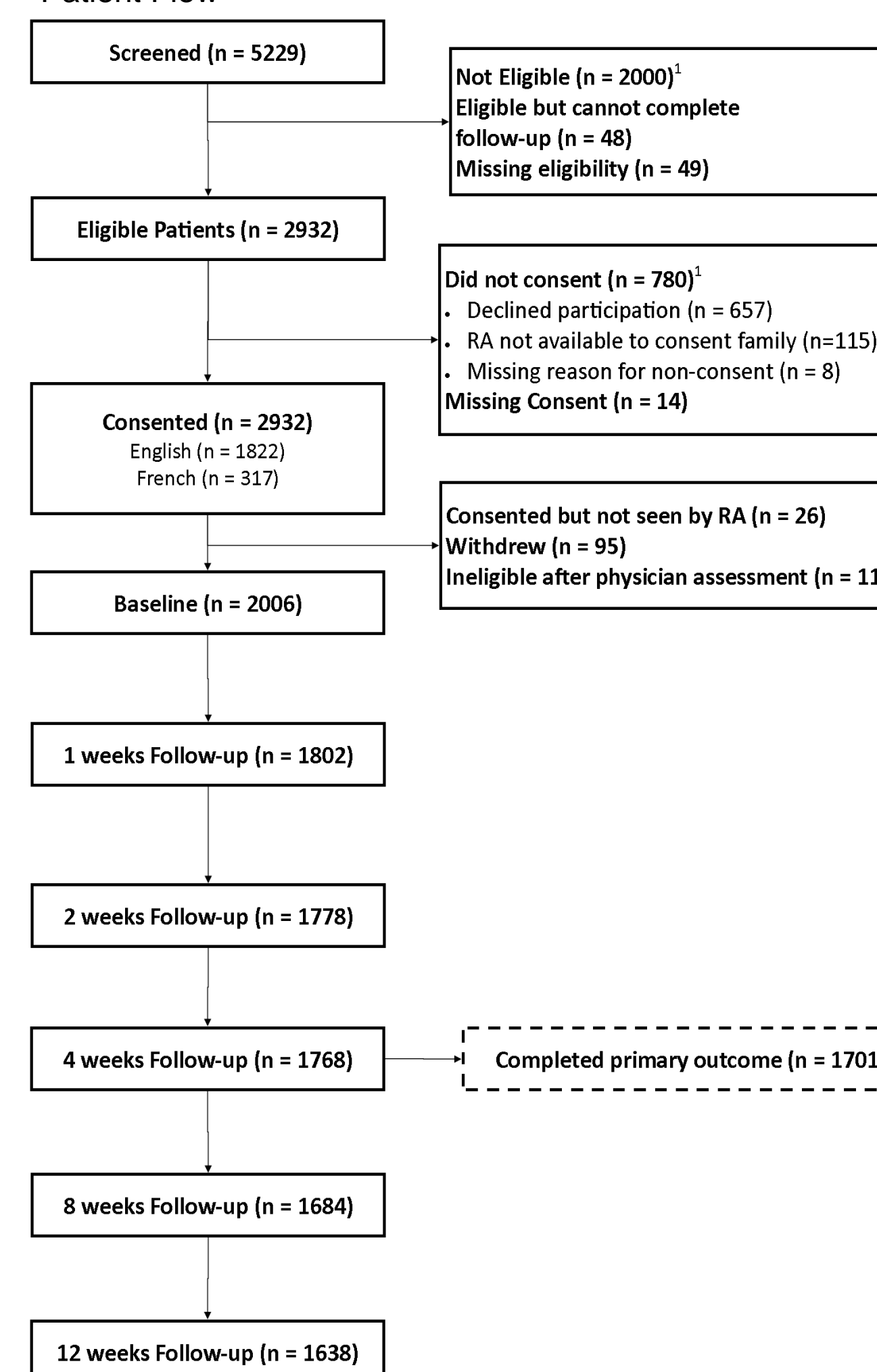
- *This is a planned a priori sub-study of the 5P study, the protocol for which has already been published (Zemek et al., 2013).
- A prospective multicentre cohort study across 9 Canadian academic pediatric emergency departments.
- Eligible children 5-17 years of age, presenting to the ED within 48 hours of suffering a concussion, completed the Pediatric Quality-of-Life (PedsQL) Inventory (a validated tool for children) at 1 month and 3 months post-injury.
- The primary analysis compared the total PedsQL score of participants with and without persistent concussive symptoms (PCS) at one month.
- Secondary analyses compared PedsQL subdomains between participants with and without (PCS) at one month.
- All comparisons were performed using Mann-Whitney U tests and were completed using SPSS v. 22.

Results

Table 1. Baseline Characteristics

Characteristic	Patients (n=2024)
Age (mean (SD))	11.7 (3.4)
Female (%)	770 (38.0)
Clinical Features	
History (%)	
Time between ED visit and head injury (hours) (median, IQR)	2.8 (1.4-10.9)
Previous number of concussions	
0	1532 (75.7)
1	293 (14.5)
2+	171 (8.4)
Migraine	242 (12.0)
Learning disabilities	179 (8.8)
ADD/ ADHD	190 (9.4)
Clinical (%)	
Loss of consciousness	239 (11.8)
Dazed and confused	972 (48.0)
Answers questions slowly	807 (39.9)
Forgetful of recent information	411 (20.3)
No early signs of confusion or forgetfulness	727 (35.9)
Injury (%)	
Mechanism of injury	
Sports/Recreational Play	1350 (66.7)
Non-Sport related injury/fall	496 (24.5)
Other	156 (7.7)

Patient Flow



Pediatric Quality of Life Inventory

The PedsQL Inventory (total score) is the primary outcome measure. The PedsQL is a reliable and valid measure of health-related quality of life in healthy children and adolescents and those with acute and/or chronic health conditions. The inventory covers four domains: physical, emotional, social, and school (8, 5, 5, and 5 items, respectively). Items are calculated and transformed into an overall score with a range of 0-to-100 points, with 100 points indicating better quality of life.

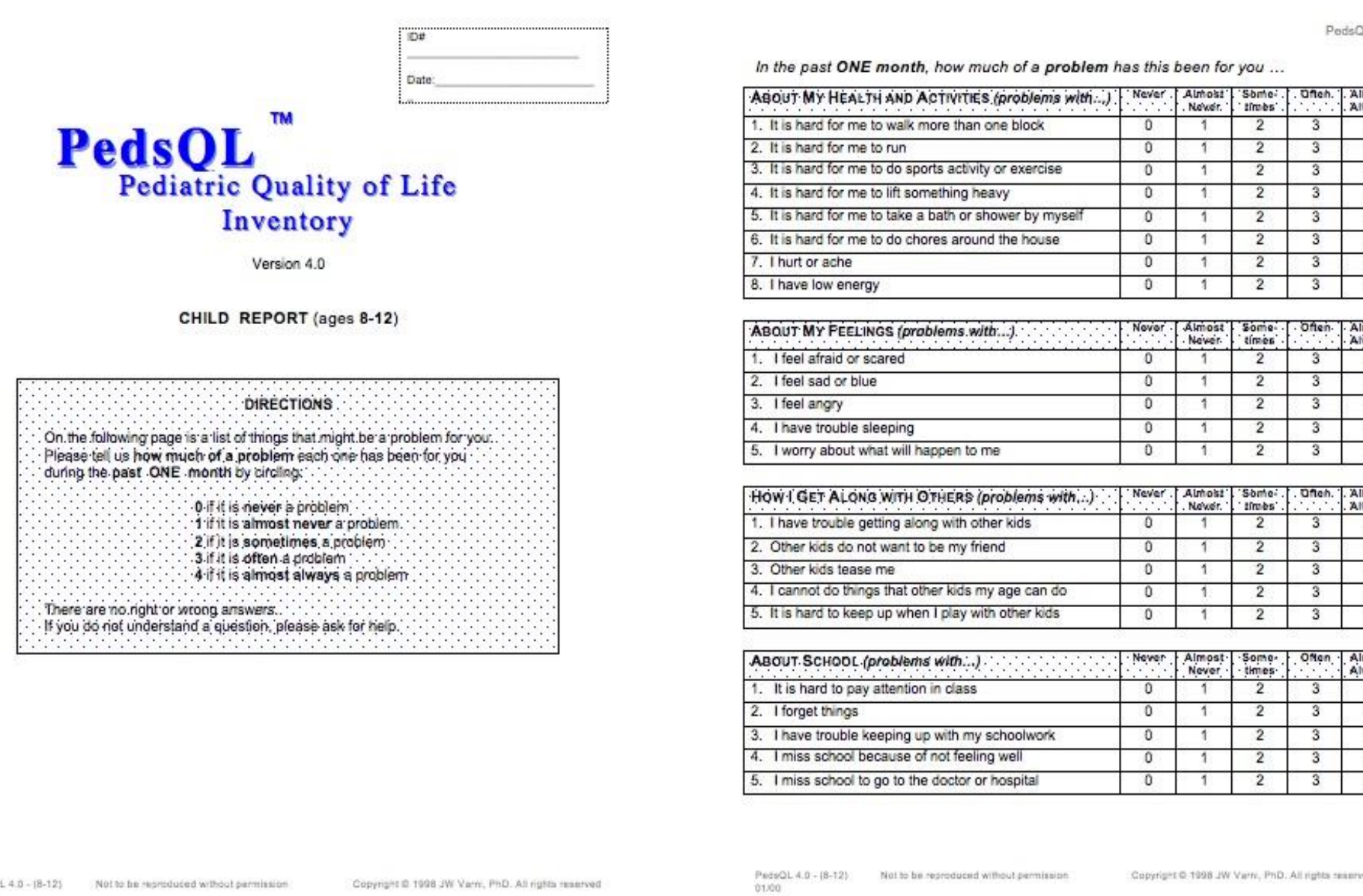


Figure 1. PedsQL total score in participants with and without persistent concussive symptoms at 1 month post-injury.

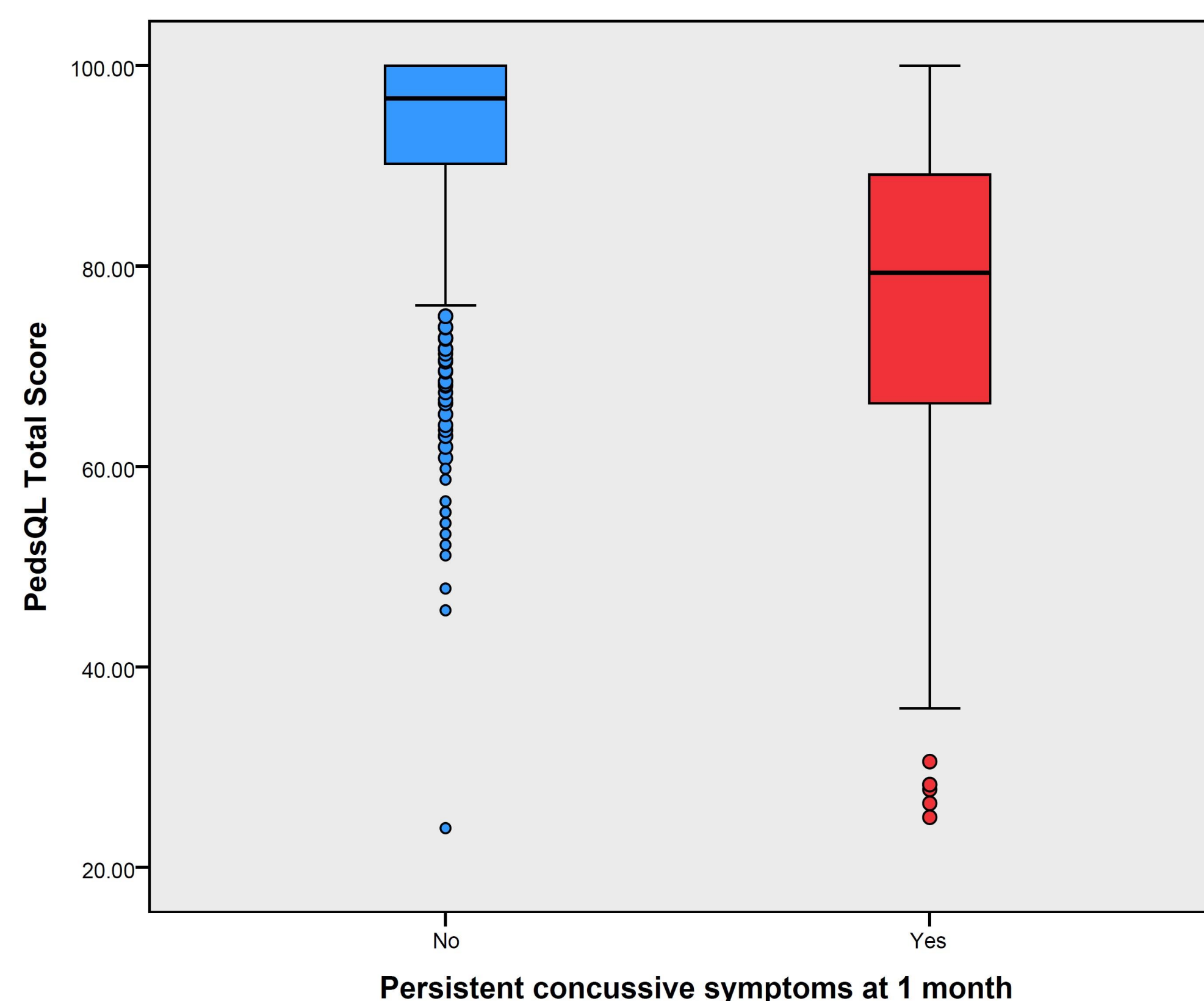


Table 2. Total and domain-specific PedsQL scores at 1 month

	Persistent concussive symptoms at 1 month			
	N	Median (IQR)	Median (IQR)	P value
TOTAL	1666	97 (90-100)	79 (66-89)	<0.001
Physical	1666	100 (97-100)	84 (69-94)	<0.001
Emotional	1662	100 (85-100)	75 (60-90)	<0.001
Social	1515	100 (95-100)	90 (75-100)	<0.001
School	1666	95 (80-100)	70 (55-85)	<0.001

Discussion

- Children with PCS achieved a significantly lower PedsQL total score compared to children without PCS at 1 month post-injury, thus presenting a lower overall quality of life.
- Children with PCS also obtained significantly lower scores on the physical, emotional, social and sleep domains of the PedsQL when compared with children without PCS at 1 month post-injury.
- Our results will allow insight into the burden of pediatric concussion, and help us to identify patients and families requiring extra support or guidance regarding expectation management and coping mechanisms.
- Our results will also help guide future interventions in order to reduce concussion's impact on quality of life.

Acknowledgements

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