Can Canadian paramedic students accurately estimate pediatric weight?

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Background

- The safe administration of medications to patients is an important part of paramedic practice.
- Pediatric medication doses are generally calculated based on patient weight.
- In the absence of a known weight, paramedics must rely on measurement tools, such as the Broselow tape.
- These methods can be unreliable in certain populations, and are not available to all paramedics.
- Paramedics are taught several methods for estimating pediatric weight, including various age-based formulae.
- Previous studies have demonstrated that paramedics find estimation of pediatric weights challenging, and their estimation abilities are often inaccurate.
- These inaccurate weight calculations may lead to under- or over-dosing of patients.

Objective

- This study aimed to explore Canadian paramedic students abilities related to pediatric weight estimation.

Methods

- Prospective observational study of paramedic students at Fanshawe College, Ontario, Canada.
- Ethics approval was received from Fanshawe College REB.
- Participants were asked to estimate pediatric weight based on photos of 10 pediatric patients whose weights were known to the researchers.

Results

- 67 students participated in the study; 39 first years and 28 second years.
- There was no statistically significant difference in estimation accuracy between first-year and second-year students with the exception of one subject (Subject A) *(Fig. 1)*
- Second-year students underestimated weight in 7/10 subjects whereas first-year students underestimated weight in 5/10 subjects.
- 18.8% of estimations made were within ±5% range of actual weight, 38.4% within ±10% range, and 62.4% within ±20% range *(Fig. 2)*

Subject	Actual (kg)	Mean (kg)	Min (kg)	Max (kg)
A	37.0	29.33	17.24	45.36
B	21.7	21.88	13.61	31.75
C	73.9	63.18	32.00	85.00
D	13.3	14.72	8.16	22.68
E	52.9	52.56	30.00	74.84
F	17.0	17.09	9.07	27.22
G	33.2	37.77	15.88	56.70
H	23.3	20.71	11.34	36.29
I	39.6	34.52	20.41	49.90
J	39.4	33.67	19.50	50.00

Figure 1. Weight estimations of pediatric patients by participant groups

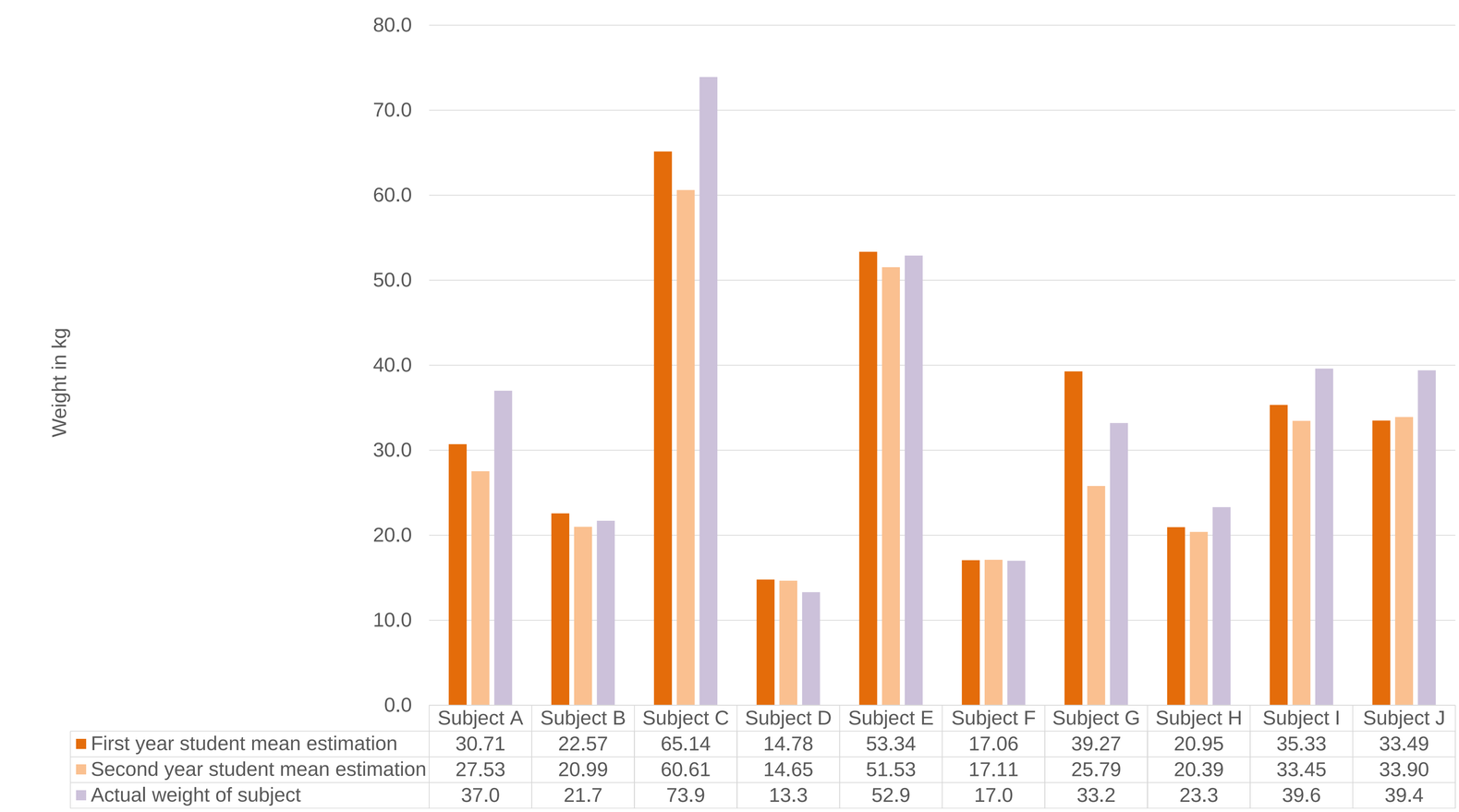
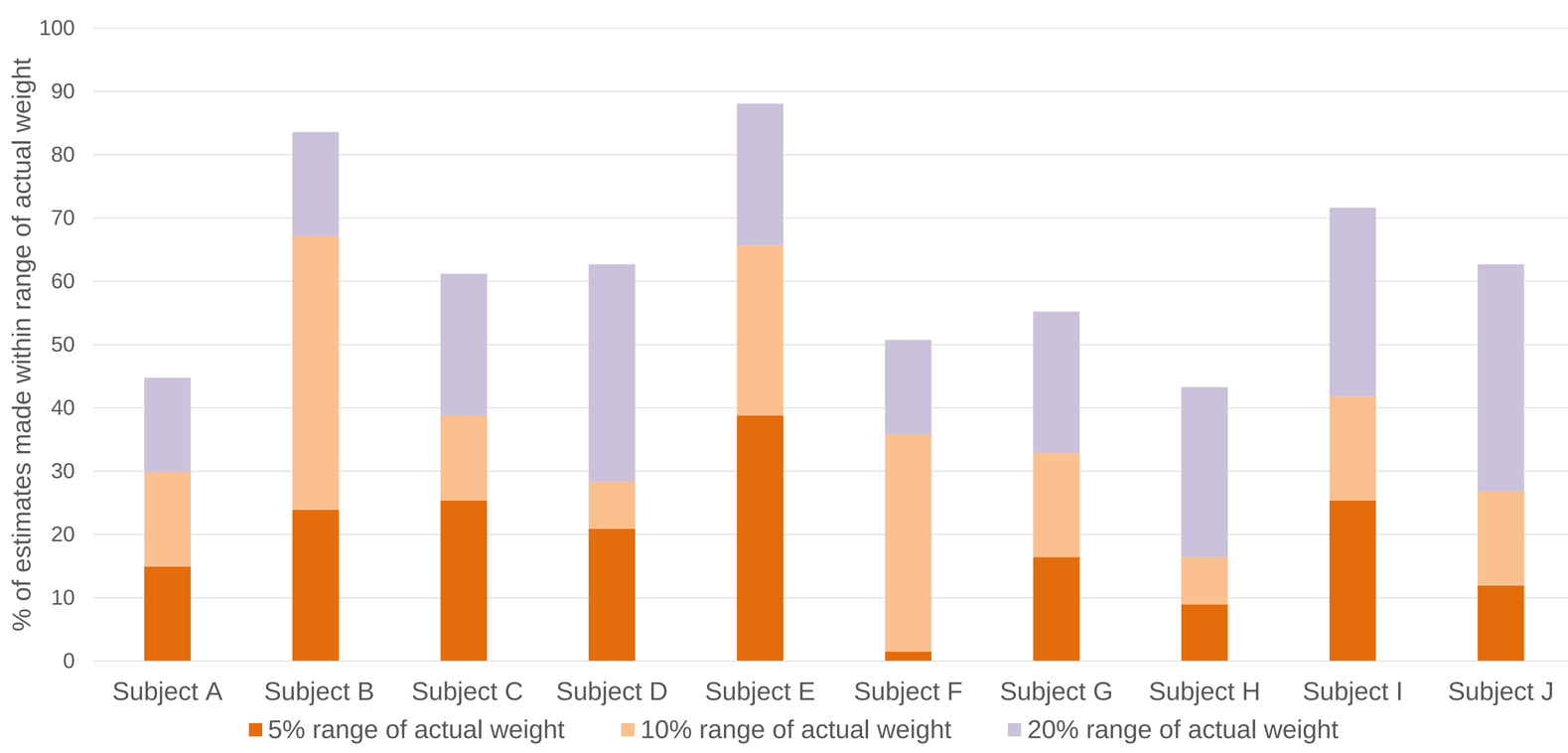


Figure 2. Overall accuracy of weight estimation



Conclusion

- Paramedic students demonstrated variance and inaccuracy in the estimation of pediatric weights using combinations of observation and age-based calculations.
- These results are consistent with existing findings in Australian paramedic students.
- Our results suggest that paramedic students, and potentially practicing paramedics may benefit from improved methods for estimation of pediatric weights.

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