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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.

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.

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 $\pm 5\%$ range of actual weight, 38.4% within $\pm 10\%$ range, and 62.4% within $\pm 20\%$ 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

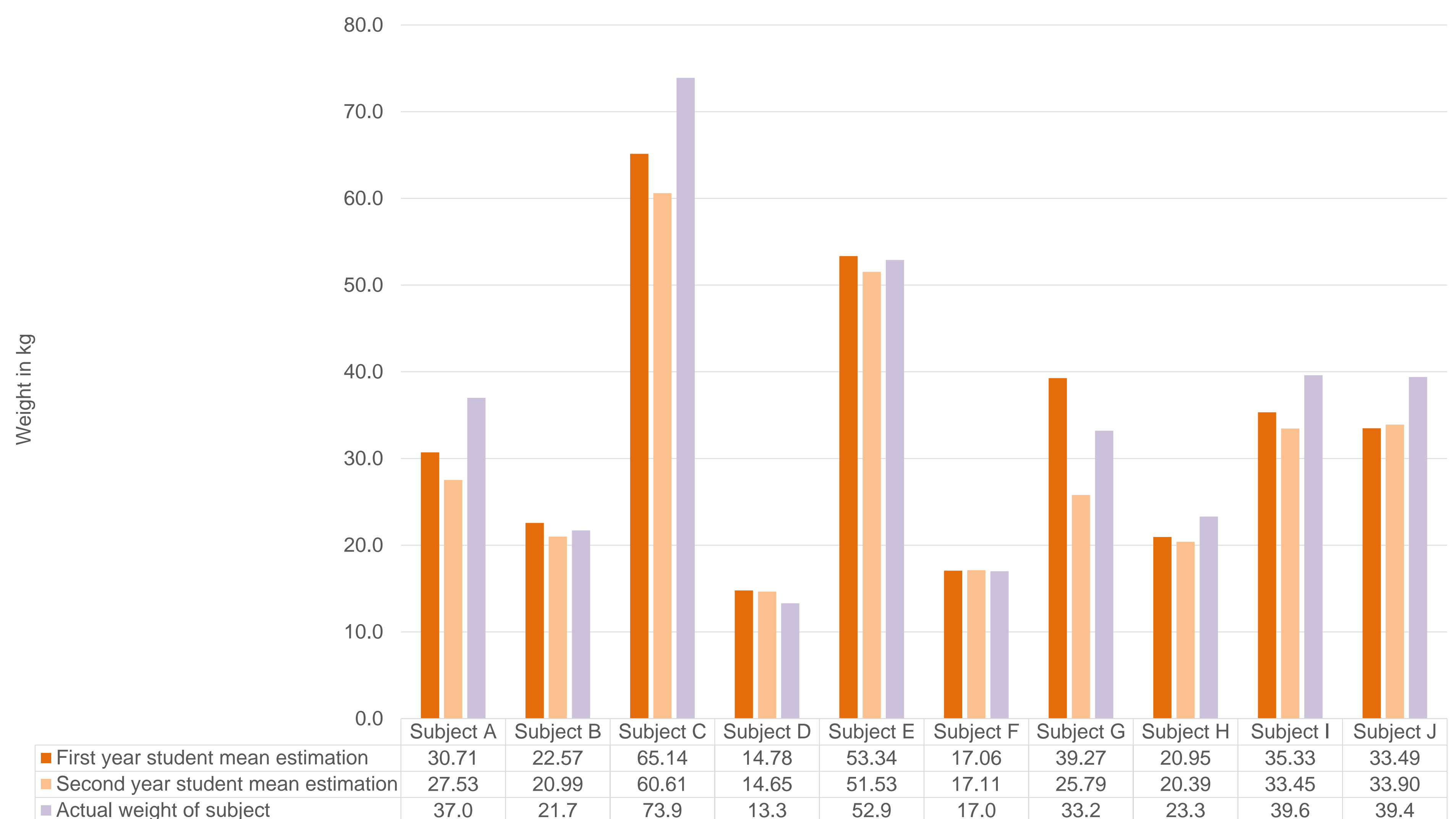


Figure 2. Overall accuracy of weight estimation

