The Baby-led Weaning Method in a Canadian Setting: A Focus on Mealtime Behaviours, Food Acceptance, Fine Motor Skills and Sensory Modulation.

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Introduction

- Current Canadian infant feeding guidelines promote the introduction of complementary feeding at around six months of age with purees spoon-fed by an adult with a gradual progression towards thicker and more frequent solid finger foods (1).
- Baby-led weaning is an alternative weaning method that proposes to let children feed themselves from six months of age with age-appropriate solid finger foods (2).

Research Problem:

Over the last years, Baby-led weaning has rapidly gained in popularity across the globe notably in Canada, but research is limited on its behavioural, nutritional and developmental impacts of infants introduced to this feeding method.

Research Objectives:

Compare the Traditional spoon-feeding (TSF) and Baby-led weaning (BLW) methods in terms of:

- 1) Mealtime Behaviours 2) Food Acceptance
3) Fine Motor Skills 4) Sensory Modulation

Hypothesis:

The BLW method will be associated with more positive mealtime behaviours, a greater food acceptance, better fine motor skills as well as differences in sensory modulation compared to the TSF method.

Table 3: Fine motor and sensory modulation mean scores between weaning groups

Sensory categories	BLW n = 41 Mean (SE)	TSF n = 38 Mean (SE)	p-value
Fine motor skills			
Grasping†	11.0 (0.4)	10.0 (0.4)	0.05
Visuo-Motor Integration†	11.2 (0.3)	10.7 (0.2)	0.2
Fine Motor Quotient‡	106.4 (1.6)	102.0 (1.6)	0.05
Sensory modulation			
<i>Quadrants</i>			
Seeking/Seeker*	30.2 (0.6)	30.6 (0.6)	0.65
Avoiding/Avoider*	14.7 (0.6)	14.8 (0.8)	0.91
Sensitivity/Sensor*	22.2 (0.8)	22.4 (1.0)	0.86
Registration/Bystander*	15.9 (0.7)	14.4 (0.5)	0.09
Sensory and Behavioural Sections			
General*	16.4 (0.5)	15.4 (0.7)	0.24
Auditory*	10.3 (0.5)	9.2 (0.3)	0.09
Visual*	17.1 (0.7)	18.4 (0.6)	0.17
Touch*	8.8 (0.5)	8.3 (0.6)	0.50
Movement*	18.9 (0.4)	18.1 (0.5)	0.23
Oral*	12.1 (0.6)	13.1 (0.7)	0.25
Behavioural*	10.6 (0.4)	9.4 (0.4)	0.05

† Data is presented as mean Fine Motor Subtest Standard Scores $\pm$ standard error (SE). ‡ Data is presented as mean Fine Motor Quotient $\pm$ standard error (SE). The Fine Motor Quotient (FMQ) is a composite of the results of grasping and visuo-motor integration subtests. * Data is presented as mean raw scores $\pm$ standard error (SE). P-values were estimated using t-Tests. BLW: Baby-led weaning; TSF: Traditional spoon-feeding.

Methodology

Participants:

- 82 children between 10-14 months who either followed the BLW (n=41) or the TSF (n=41) methods.
- Inclusion criteria: Born at term with a normal birth weight.
- Exclusion criteria: Any mental or physical disabilities.

Data collection:

Phase 1: Online Questionnaires
Sociodemographic and Early Feeding Practices Questionnaire
Child Eating Behaviour Questionnaire
Food Acceptance Questionnaire

Phase 2: In-person Evaluations

Peabody Developmental Motor Scale 2
Sensory Profile 2 for Toddlers

Statistical Analysis:

- Mean scores of mealtime behaviours, fine motor and sensory skills were compared between the BLW and TSF methods using t-tests adjusted for the parental pressure when applicable.
- The odds of having a higher degree of food acceptance (based on the median of acceptance score) for eight food categories between the BLW and TSF methods was estimated using logistic regressions.

Results

Table 1: Mealtime-related food behaviours scores between weaning groups.

Food behaviours	BLW (n = 41)	TSF (n = 41)	<i>p</i> -value for feeding method	<i>p</i> -value for parental pressure
	Mean (SE)	Mean (SE)		
Food responsiveness	13.0 (0.7)	13.3 (0.7)	0.80	0.10
Emotional overeating	5.7 (0.4)	6.0 (0.4)	0.50	1.00
Enjoyment of food	17.1 (0.4)	16.7 (0.4)	0.50	0.03
Desire to drink	7.7 (0.4)	7.6 (0.4)	0.84	0.31
Satiety responsiveness	13.6 (0.5)	11.6 (0.5)	0.005	0.0005
Slowness in eating	11.4 (0.5)	10.0 (0.5)	0.04	0.08
Emotional under-eating	12.3 (0.4)	11.4 (0.4)	0.17	0.14
Food fussiness	10.6 (0.5)	11.4 (0.5)	0.31	0.0003

Data is presented as mean $\pm$ standard error (SE) and *p*-values were derived from general linear models which included individual food behaviour and parental pressure (*p*-values adjusted for each other). BLW: Baby-led weaning; TSF: Traditional spoon-feeding. Bold values indicate statistical significance (*p* < 0.05).

Table 2: Food acceptance to eight food categories between weaning groups.

Food categories	BLW (n = 41) n (%)†	TSF (n = 41) n (%)†	OR (95% CI)‡	p-value for feeding method	p-value for parental pressure
Baby foods	16/34 (47%)	20/38 (53%)	0.61 (0.22-1.72)	0.35	0.23
Fruits	23/41 (56%)	18/41 (44%)	1.27 (0.50-3.28)	0.62	0.17
Vegetables	19/41 (46%)	22/41 (54%)	0.55 (0.21-1.45)	0.23	0.12
Grain products	22/41 (54%)	18/40 (45%)	0.96 (0.36-2.52)	0.93	0.04
Milk and alternatives	21/39 (54%)	16/39 (41%)	1.10 (0.41-2.96)	0.85	0.02
Meat and alternatives	19/41 (46%)	22/41 (54%)	0.47 (0.17-1.27)	0.13	0.03
Sweets	19/37 (51%)	14/29 (48%)	0.79 (0.27-2.31)	0.67	0.08
Processed foods	16/33 (48%)	16/32 (50%)	0.81 (0.29-2.30)	0.69	0.41

† Data is presented as the number (and percentage) of infants in the higher food acceptance category based on the median value. Sample size under 41 per feeding method means that some infants have never been exposed to any food in this category. ‡ Odds ratio (OR) and 95% confidence interval (CI) were calculated using logistic regressions adjusted for the parental pressure. BLW: Baby-led weaning; TSF: Traditional spoon-feeding. Bold values indicate statistical significance ($p < 0.05$). Values represent the odds of a child accepting to eat various foods in each category depending on if they have followed a BLW approach compared to a TSF method.

Discussion

This interdisciplinary project suggests that the BLW method is associated with a better ability to regulate food intake in relation to satiety and a slower eating pace which may help to prevent overweight and obesity in children.

As opposed to what we expected, BLW does not seem to increase the likelihood of accepting a range of food groups. Results may be explained by the high overall food acceptance rates of children.

In regards to fine motor skills, our results suggest that baby-led children had borderline significantly better grasping skill, and thus, a significantly higher FMQ than those conventionally weaned. This may be explained by the BLW group's earlier exposure to solid foods, possibly giving them more opportunities to explore and manipulate. This would be consistent with the dynamical systems theory whereby motor skills are attained through the interaction of the individual and the requirements of a movement task (3).

Baby-led children tend to be more bystanders than conventional feeders meaning they are less likely to be bothered by what goes on around them (4), to be more sensitive to things they heard, and to change their ways of acting when they are exposed to sensory experiences. However, none of these indicators reached statistical significance.

We are the first Canadian study to evaluate food behaviours and the first research worldwide to assess food acceptance, fine motor skills and sensory modulation between the BLW and TSF methods. It must however be noted that results rely mainly on self-reported information.

Conclusion

The results of this study indicate that BLW promote healthy diet-related behaviours and may help to reduce weight gain in children by improving their food intake in relation to satiety in addition to slowing down their eating pace. Our study also suggests that self-feeding with appropriate solid food right from the beginning of complementary feeding tends to promote better fine motor skills in children. Lastly, our study confirms the parents should be aware of the negative impact of high parental pressure over their child's food intake.

Bibliography

1. Canada H. Nutrition for Healthy Term Infants: Recommendations from Six to 24 Months [Internet]. aem. 2014 [cité 12 nov 2018]. Disponible à : <https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months/6-24-months.html>
2. On behalf of the Italian Society of Pediatrics, D'Auria E, Bergamini M, Staiano A, Banderali G, Pendenza E, et al. Baby-led weaning: what a systematic review of the literature adds on. *Ital J Pediatr* [Internet]. déc 2018 [cité 12 nov 2018];44(1). Disponible à : <https://jiponline.biomedcentral.com/articles/10.1186/s13052-018-0487-8>
3. Gaul D, Issartel J. Fine motor skill proficiency in typically developing children: On or off the maturation track? *Hum Mov Sci*. 1 avr 2016;46:78-85.
4. Dunn W. *Sensory Profile 2: Strengths-Based Approach to Assessment and Planning*. Pearson; 2014. 268 p.