Parental Substance Use and its Effect on Offspring Growth at Birth, 6 months and 12 months

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Background

- A child's growth (BMI, height, weight) during infancy is heavily influenced by maternal behaviors, such as substance use (alcohol, smoking and cannabis), that occurred during and before pregnancy.
- However, it is less explored whether paternal behaviors, prior to fertilization, influence as maternal behaviors do and whether one substance may have a greater impact than another

Objective

- The first objective of this analysis is to determine if paternal alcohol consumption, smoking, and cannabis use significantly affected a child's growth at different points at birth, 6 months and 1 year
- The second objective of this analysis is to determine which substance had the greatest effect if at all

Setting

- University of Chile Institute of Nutrition and Food Technology (INTA)
- INTA is a research center that aims to conduct research on food and nutrition to be able to promote positive change to the Chilean population

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Instituto de Nutrición y Tecnología de los Alimentos
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Methods

- A secondary analysis of the Santiago Longitudinal Study and related study was conducted
- Parent-dyads were produced based on both datasets n=248
- A repeated measures ANOVA was used to determine if the different substances (tobacco, alcohol, and cannabis) affected the offspring's BMI, height, and weight z-scores at different time points during their first year of life
- Analysis was conducted on Stata 15

- **Binary Exposures:**
- Both parents: Cannabis use, alcohol use, and smoking cigarettes
- Fathers only: Cannabis use, alcohol use, and smoking cigarettes
- Mothers only: Cannabis use, alcohol use, and smoking cigarettes
- **Outcome:**
- BMI, height, and weight z-scores in offspring

Results

Table 1: Parental Descriptive Characteristics

Variable	Fathers n=88	Mothers n=161	Total n=249
Smoking n(%)			
Yes	41 (32.28%)	86 (67.27%)	127
No	36 (36.73%)	62 (63.26%)	98
Cannabis n(%)			
Yes	32 (42.11%)	44 (57.89%)	78
No	45 (30.20%)	104 (69.80%)	149
Drinking n(%)			
Yes	53 (32.72%)	109 (67.28%)	162
No	24 (38.10%)	39 (61.90%)	63
Parental age during birth of first born mean(SD)	21.0 (2.3)	20.7 (2.3)	20.8 (2.3)
Socioeconomic Status n(%)			
Least vulnerable	36 (35.29%)	66 (64.71%)	102
Somewhat vulnerable	26 (32.91%)	53 (67.09%)	79
Most vulnerable	26 (38.81%)	41 (61.19%)	67
Parental education n(%)			
Did not finish HS	3 (21.43%)	11 (78.57%)	14
Finished HS as an adult	9 (26.47%)	25 (73.53%)	34
Finished HS on time	65 (39.39%)	100 (60.61%)	165

*Smoking, Drinking and Cannabis had 23 missing values; SES had 1 missing value; Parental education had 36 missing values

Results

- BMI z-scores were significantly higher in smokers vs non-smokers in the parent dyad sample (0.153 vs -0.005 respectively; *P*=.012) at birth
- BMI z-scores were also significantly higher in the maternal dyad sample for smokers vs non-smokers (0.080 vs. -0.011 respectively; P=.008) at birth
- Height z-scores were significantly lower when comparing cannabis users vs non-users in the maternal dyad sample (-0.345 vs -0.053 respectively; *P*=0.042) at birth

Table 2 Repeated measures ANOVA on the dependent variable: Parental smoking (n=248) 23 missing

Variable	Time	Range	Smoking (YES) (N=127) M ± SE	Smoking (NO) (N=98) M ± SE	Source	*F*	*p*
BMI z-score for age and sex	birth	-5.44-5.87	0.153 ± 0.100	-0.005 ± 0.114	Group	6.29	0.012
	6 mo	-1.86-4.55	0.580 ± 0.109	0.400 ± 0.119	Time	18.42	<0.001
	12 mo	-2.1-4.57	0.925 ± 0.112	0.568 ± 0.124	G*T	0.45	0.638
Height z-score for age and sex	birth	-5.45-2.6	-0.211 ± 0.105	0.011 ± 0.120	Group	3.27	0.071
	6 mo	-5.68-2.32	-0.493 ± 0.114	-0.217 ± 0.125	Time	2.41	0.091
	12 mo	-3.89-3.48	-0.239 ± 0.117	-0.21 ± 0.130	G*T	0.56	0.569
Weight z-score for age and sex	birth	-5.36-3.88	-0.005 ± 0.097	0.015 ± 0.110	Group	0.44	0.507
	6 mo	-3.64-4.1	0.145 ± 0.105	0.175 ± 0.115	Time	7.59	<0.001
	12 mo	-1.72-4.22	0.540 ± 0.108	0.313 ± 0.119	G*T	0.86	0.425

*Highlighted yellow for significance or headed toward significance

Table 3 Repeated measures ANOVA on the dependent variable: Maternal smoking (n=161) 13 missing

Variable	Time	Range	Smoking (YES) (n=86) M ± SE	Smoking (NO) (n=62) M ± SE	Source	*F*	*p*
BMI z-score for age and sex	birth	-4.97-2.45	0.080 ± 0.118	-0.011 ± 0.138	Group	7.14	0.008
	6 mo	-1.8-4.55	0.620 ± 0.128	0.270 ± 0.146	Time	13.44	<0.001
	12 mo	-2.1-4.57	0.942 ± 0.127	0.499 ± 0.150	G*T	0.95	0.387
Height z-score for age and sex	birth	-4.96- 2.6	-0.217 ± 0.133	-0.033 ± 0.157	Group	3.10	0.079
	6 mo	-5.68- 2.32	-0.577 ± 0.145	-0.189 ± 0.165	Time	1.48	0.230
	12 mo	-3.89-3.48	-0.270 ± 0.145	-0.181 ± 0.170	G*T	0.48	0.620
Weight z-score for age and sex	birth	-4.8-2.25	-0.068 ± 0.118	-0.003 ± 0.138	Group	0.49	0.486
	6 mo	-3.64-4.1	0.122 ± 0.128	0.096 ± 0.146	Time	5.35	0.005
	12 mo	-1.72-4.22	0.534 ± 0.128	0.265 ± 0.150	G*T	0.81	0.445

*Highlighted yellow for significance or headed toward significance

Table 4 Repeated measures ANOVA on the dependent variable: Maternal cannabis consumption (n=161) 13 missing

Variable	Time	Range	Cannabis (YES) (N=44) M ± SE	Cannabis (NO) (N=104) M ± SE	Source	*F*	*p*
BMI z-score for age and sex	birth	-4.97-2.45	-0.036 ± 0.166	0.074 ± 0.108	Group	0.03	0.853
	6 mo	-1.8-4.55	0.480 ± 0.179	0.463 ± 0.115	Time	13.93	<0.001
	12 mo	-2.1-4.57	0.873 ± 0.189	0.712 ± 0.115	G*T	0.42	0.658
Height z-score for age and sex	birth	-4.96- 2.6	-0.345 ± 0.187	-0.053 ± 0.121	Group	4.15	0.042
	6 mo	-5.68- 2.32	-0.630 ± 0.201	-0.316 ± 0.130	Time	1.44	0.237
	12 mo	-3.89-3.48	-0.400 ± 0.212	-0.171 ± 0.129	G*T	0.03	0.968
Weight z-score for age and sex	birth	-4.8-2.25	-0.203 ± 0.165	0.029 ± 0.107	Group	1.33	0.250
	6 mo	-3.64-4.1	-0.011 ± 0.177	0.161 ± 0.115	Time	5.99	0.003
	12 mo	-1.72-4.22	0.411 ± 0.187	0.424 ± 0.114	G*T	0.28	0.753

*Highlighted yellow for significance or headed toward significance

Conclusions

- There was no significant difference in growth measurements within the paternal sample when evaluating the use of different substances for any time point
- Exposure to cigarettes had the greatest impact which was seen in both the parent-child and mother-child samples.

Future Direction

- Future research should use a greater sample and include time points later in the child's life.

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