

CLIN NUTR | 根据孕前体质指数计算的妊娠期体重增加与产后短期体重滞留的关系

本文关键字：妊娠期体重增加、产后体重滞留、体质指数

影响因子：5.496

建议阅读时间：1.5 分钟

背景&目的

本研究旨在评估孕前体质指数、妊娠期体重增加和产后体重滞留之间的关系，并阐明中国女性产后体重滞留的预测因素。

方法

采用多阶段分层随机抽样方法进行横断面研究。

结果

研究共纳入 1643 名女性。平均妊娠期增重 15.9kg，产后平均体重滞留 5.1kg。43.2% 的女性妊娠期体重增加过多，53.3% 的女性产后体重滞留 ≥ 5 kg。此外，增重不足的体重较轻女性及增重过多的超重女性比例分别为 24.2% 和 52.3%。Logistic 回归分析显示，与体重正常的女性相比，超重女性妊娠期增重过多的校正后 OR 为 1.74 (95%CI: 1.09-2.79)。在所有三个体质指数组中，过度妊娠期体重增加女性的产后体重保持率和产后体重保持率为 5 kg 或更高的女性比例显著高于足够的妊娠期体重增加女性。与那些妊娠期体重增加在推荐范围内的女性相比，妊娠期体重增加超过推荐范围的体重较轻、正常体重以及超重女性，其体重增加 ≥ 5 kg 的校正后 OR 至少为 1.90。

结论

妊娠期体重增加超过推荐量会增加所有体质指数组产后体重滞留的风险。

Table 1

The difference in the proportion of the gestational weight gain (GWG) by Institute of Medicine recommendations according to different maternal characteristics, including prepregnancy body mass index (BMI), maternal age, education level, income level, delivery mode, and baby birth weight.

Maternal characteristic	No.	Mean (SE) of GWG	P	Inadequate N (%)	Adequate N (%)	Excessive N (%)	P
Total	1643	15.88 (0.16)		376 (22.9)	558 (33.9)	710 (43.2)	
Prepregnancy BMI (kg/m²)							
Underweight	356	16.66 (0.31)	0.001	86 (24.2)	141 (39.6)	129 (36.2)	0.003
Normal	1155	16.16 (0.18)		257 (22.2)	387 (33.5)	511 (44.3)	
Overweight	132	11.30 (0.67) ^b		33 (25.0)	30 (22.7)	69 (52.3)	
Maternal age, years							
≤25	413	15.73 (0.33)	0.007	109 (26.4)	130 (31.5)	174 (42.1)	0.1
25–30	766	16.37 (0.23)		153 (20.0)	272 (35.5)	341 (44.5)	
>30	443	15.21 (0.28)		107 (24.2)	148 (33.4)	188 (42.4)	
Education							
Less than high school	697	15.08 (0.24)	0.001	196 (28.1)	222 (31.9)	279 (40)	0.001
Above high school	946	16.47 (0.2)		180 (19)	336 (35.5)	430 (45.5)	
Income (RMB, Yuan)							
<2000	452	15.33 (0.3)	0.1	120 (26.5)	150 (33.2)	182 (40.3)	0.2
2000–6000	803	16.11 (0.22)		174 (21.7)	272 (33.9)	357 (44.5)	
>6000	301	15.86 (0.37)		63 (20.9)	110 (36.5)	128 (42.5)	
Delivery mode							
Cesarean section	848	16.54 (0.22)	0.001	174 (46.8)	264 (48.0)	410 (58.4)	0.001
Natural delivery	776	15.15 (0.21)		198 (53.2)	286 (52.0)	292 (41.6)	
Baby birth weight							
Mean (SE)				3.29 (0.03) ^a	3.38 (0.03)	3.51 (0.02) ^a	
Low (<2.5 kg)	24	14.46 (1.01)	0.01	7 (1.9)	8 (1.4)	9 (1.3)	0.003
Normal (2.5–4 kg)	1445	15.75 (0.16)		345 (91.8)	498 (89.2)	602 (84.9)	
High (≥4 kg)	174	17.15 (0.51)		24 (6.4)	52 (9.3)	98 (13.8)	

^a, P < 0.05 compared with adequate GWG women.

^b, P < 0.05 compared with normal weight women.

Table 2

Mean postpartum weight retention (kg) at 1–2 months, 3–5 months, and 6–11 months among women with different gestational weight gain according to Institute of Medicine recommendations, prepregnancy body mass index groups, maternal ages, education levels, income levels, delivery modes, and baby feeding methods.

Maternal indices	Total			1–2 months			3–5 months			6–11 months		
	No.	Mean (SE)	P	No.	Mean (SE)	P	No.	Mean (SE)	P	No.	Mean (SE)	P
Total	1643	5.11 (0.14)		664	6.18 (0.22)		498	5.23 (0.25)		481	3.52 (0.23)	0.01
Gestational weight gain according to Institute of Medicine												
Inadequate	376	2.1 (0.28) ^a	0.001	159	1.96 (0.42) ^a	0.01	119	2.93 (0.46)	0.01	98	1.31 (0.57) ^a	0.01
Adequate	558	4.21 (0.17)		223	5.42 (0.25)		172	3.92 (0.34)		163	2.86 (0.30)	
Excessive	709	7.42 (0.21) ^a		282	9.15 (0.32) ^a		207	7.63 (0.39) ^a		220	5.00 (0.34) ^a	
Prepregnancy body mass index (kg/m²)												
Underweight	356	5.87 (0.27)	0.001	149	7.47 (0.38) ^a	0.01	96	5.57 (0.51)	0.01	111	3.99 (0.47)	0.01
Normal	1156	5.37 (0.15)		469	6.4 (0.24)		359	5.46 (0.28)		328	3.82 (0.25)	
Overweight	131	0.71 (0.65) ^a		46	-0.27 (1.1) ^a		43	2.53 (1.09) ^a		42	-0.06 (1.1) ^a	
Maternal age, years												
≤25	413	5.1 (0.29)	0.2	159	6.80 (0.47)	0.3	147	4.73 (0.45)	0.4	107	3.11 (0.56)	0.06
25–30	766	5.33 (0.19)		323	6.08 (0.32)		225	5.45 (0.34)		218	4.09 (0.30)	
>30	442	4.74 (0.27)		174	5.85 (0.40)		119	5.37 (0.58)		149	2.95 (0.42) ^a	
Education												
≤high school	697	4.71 (0.22)	0.01	257	5.93 (0.39)	0.4	220	4.74 (0.36)	0.08	220	3.24 (0.38)	0.5
>high school	946	5.4 (0.17)		406	6.32 (0.26)		278	5.61 (0.34)		261	3.76 (0.28)	
Income (RMB, Yuan)												
≤2000	452	4.81 (0.27)	0.05	171	6.14 (0.43)	0.5	154	4.91 (0.47)	0.04	127	2.90 (0.44)	0.2
2000–6000	802	5.43 (0.19)		320	6.35 (0.31)		245	5.80 (0.36)		237	3.79 (0.32)	
>6000	301	4.68 (0.32)		126	5.64 (0.56)		81	4.20 (0.46) ^a		94	3.80 (0.55)	
Delivery mode												
Cesarean	848	5.52 (0.2)	0.002	359	6.33 (0.31)	0.01	264	5.97 (0.36)	0.01	225	4.68 (0.35)	0.01
Natural	775	4.64 (0.19)		294	4.94 (0.31)		229	4.38 (0.33)		252	3.37 (0.31)	
Baby feeding method												
Artificial	381	5.0 (0.31)	0.2	176	6.17 (0.42)	0.2	143	4.3 (0.51)	0.08	62	3.28 (0.79)	0.4
Breast	644	4.88 (0.21)		254	5.72 (0.37)		185	5.52 (0.37)		205	3.26 (0.32)	
Mix	616	5.43 (0.22)		234	6.67 (0.35)		170	5.69 (0.42)		212	3.87 (0.35)	

^a P < 0.05.

Table 3

Proportion of women with postpartum weight retention (PPWR) of 5 kg or more in relation to gestational weight gain, prepregnancy body mass index, and delivery mode.

Maternal characteristic	PPWR < 5 kg N (%)	PPWR ≥ 5 kg N (%)	P	Adjusted OR (95% CI) ^a	β coefficient	P
Gestational weight gain according to Institute of Medicine						
Inadequate	266 (70.7)	110 (29.3)	0.001	0.45 (0.33, 0.6)	-0.81	0.001
Adequate	284 (50.9)	274 (49.1)		Reference		
Excessive	211 (29.8)	498 (70.2)		2.52 (1.97, 3.22)	0.92	0.001
Prepregnancy body mass index (kg/m²)						
Underweight BMI <18.5	155 (43.5)	201 (56.5)	0.001	1.10 (0.84, 1.44)	0.10	0.47
Normal BMI 18.5–24.9	518 (44.8)	638 (55.2)		Reference		
Overweight BMI ≥25	88 (67.2)	43 (32.8)		0.30 (0.20, 0.46)	-1.20	0.001
Delivery mode						
Natural delivery	399 (51.5)	376 (48.5)	0.001	0.73 (0.58, 0.91)	-0.32	0.005
Cesarean section	355 (41.9)	493 (58.1)		Reference		

^a Adjusted by gestational weight gain, prepregnancy body mass index, postpartum duration, delivery mode, income level, education level, and maternal age.

Table 4

Mean and SE of postpartum weight retention (PPWR) and the proportion of women with a PPWR of 5 kg or more in relation to inadequate, adequate, or excessive gestational weight gain (GWG) in different prepregnancy BMI groups.

	Inadequate	Adequate	Excessive	P	PPWR ≥ 5 kg/total number			P	GWG above recommendations: Adjusted OR of PPWR ≥ 5 kg ^a
					Inadequate	Adequate	Excessive		
Underweight	4.05 (0.49)	5.18 (0.35)	7.85 (0.50) ^a	0.001	31.4	58.2	71.3	0.001	1.91 (1.11, 3.28)
Normal	2.45 (0.26) ^a	4.11 (0.2)	7.79 (0.24) ^a	0.001	30.7	47.5	73.2	0.001	2.90 (2.18, 3.86)
Overweight	-5.71 (1.43) ^a	0.9 (0.88)	3.75 (0.73) ^a	0.001	12.1	26.7	45.6	0.003	2.78 (1.09, 7.83)

^a GWG within recommendations is reference, adjusted for GWG, postpartum duration, education level, income level, and maternal age.

参考文献:

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