Supplementary Table 1. Vitamin D concentration in the first trimester according different maternal characteristics.

Variables	Vitamin D (Mean ± SD)	P
Age		**0.029**
<25	18.3 ± 8.3	
25~30	18.0 ± 8.3	
30~35	18.7 ± 8.4	
≥35	20.1 ± 9.8	
BMI		**0.014**
<18.5	18.0 ± 8.8	
18.5~24	18.1 ± 8.2	
24~28	18.7 ± 8.8	
≥28	21.2 ± 8.3	
Parity		**<0.001**
Nulliparous	18.0 ± 8.3	
Multiparous	19.9 ± 9.2	
Education		**0.015**
Primary school or below	19.8 ± 8.8	
Middle school	19.1 ± 8.7	
High school	18.5 ± 8.6	
Junior college	17.9 ± 8.1	
Undergraduate or above	17.8 ± 8.2	
Monthly income (Chinese Yuan)		0.666
<1000	18.6 ± 9.2	
1000~2500	18.2 ± 8.4	
2500~4000	18.1 ± 8.3	
>4000	18.5 ± 8.5	
Smoking in early pregnancy		**0.044**
No	18.3 ± 8.4	
Yes	16.8 ± 7.7	
Drinking		0.940
Never	18.2 ± 8.4	
Occasionally	18.2 ± 8.4	
Regularly	17.0 ± 5.3	
Seasons of blood draw		**<0.001**
Spring	16.8 ± 7.3	
Summer	21.1 ± 8.6	
Autumn	17.0 ± 7.9	
Winter	15.6 ± 8.0	
Multi-vitamin intake before pregnancy		**<0.001**
Never	18.0 ± 8.3	

1~2 times/week	18.5 ± 8.1	
3~6 times/week	20.3 ± 10.5	
Everyday	21.7 ± 9.8	
Multi-vitamin intake in early pregnancy		**<0.001**
Never	17.2 ± 7.8	
1~2 times/week	20.2 ± 7.6	
3~6 times /week	20.6 ± 9.2	
Everyday	22.0 ± 9.6	

Supplementary Table 2. Linear regression for factors influence concentration of vitamin D in the first trimester.

Variable	Coefficient	Lower	Upper	*P*
Gestational weeks	0.15	0.02	0.29	**0.024**
Parity	1.30	0.30	2.30	**0.011**
Age	0.01	-0.08	0.10	0.813
BMI	0.16	0.06	0.26	**0.003**
Education	-0.58	-0.86	-0.29	**<0.001**
Income	0.26	-0.11	0.64	0.170
Smoking	-1.76	-3.25	-0.27	**0.020**
Drinking	-0.15	-1.20	0.90	0.779
Multi-vitamin intake before pregnancy	0.34	-0.10	0.77	0.128
Multi-vitamin intake in early pregnancy	1.63	1.37	1.90	**<0.001**
Season	-1.00	-1.27	-0.73	**<0.001**

Supplementary Table 3. Stratified analysis of association of vitamin D and the risk of GDM according to different genotypes.

Genotypes	Vitamin D	Adjusted OR (95%CI)	*P* for interactions
rs1544410			0.313
CC			
	Normal	1.00	
	Insufficiency	0.93 (0.55-1.58)	
CT			
	Normal	1.00	
	Insufficiency	0.27 (0.02-4.87)	
rs731236			0.693
AA			
	Normal	1.00	
	Insufficiency	0.89 (0.52-1.52)	
GA			
	Normal	1.00	
	Insufficiency	1.53 (0.05-45.94)	

				0.190
rs7041				
AA				
	Normal	1.00		
	Insufficiency	1.36 (0.58-3.23)		
CA/CC				
	Normal	1.00		
	Insufficiency	0.59 (0.29-1.20)		
rs2282679				0.481
TT	Normal	1.00		
	Insufficiency	0.67 (0.31-1.41)		
GT/GG	Normal	1.00		
	Insufficiency	1.22 (0.56-2.68)		
rs3829251				0.615
GG				
	Normal	1.00		
	Insufficiency	1.05 (0.47-2.34)		
GA/AA				
	Normal	1.00		
	Insufficiency	0.81 (0.39-1.65)		
rs6013897				0.688
TT				
	Normal	1.00		
	Insufficiency	0.91 (0.50-1.64)		
AT/AA				
	Normal	1.00		
	Insufficiency	0.79 (0.26-2.41)		
rs6599638				0.641
GG				
	Normal	1.00		
	Insufficiency	1.05 (0.38-2.90)		
GA/AA				
	Normal	1.00		
	Insufficiency	0.83 (0.43-1.59)		

Adjusted OR is adjusted for age, pre-pregnancy BMI, family history of diabetes, parity, smoking, drinking, gestational week of blood withdrawn, income, education and conception season.