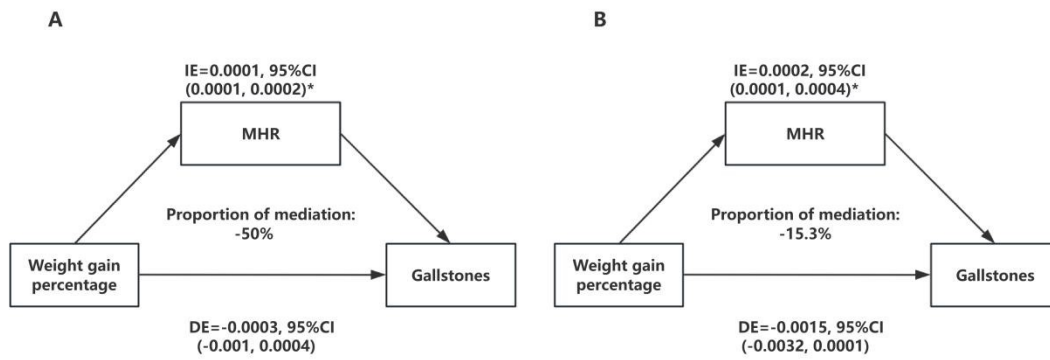


Supplementary Figure S1. The patient selection process for this study



Supplementary Figure S2. MHR as a mediator of the relationship between weight gain percentage and gallstone risk. Mediation analysis by the bootstrap test: adjusted for age, sex, race, educational level, marital status, family poverty-income ratio, smoking and drinking status, sleep duration, weight loss attempts in the past year, diabetes, hypertension, coronary heart disease, cancer, and asthma. IE: indirect effect; DE: direct effect; MHR: monocyte-to-high-density lipoprotein cholesterol ratio. * $P < 0.05$. A – Before propensity score matching, B – After propensity score matching

Supplementary Table SI. Threshold effect analysis of the relationship between weight gain percentage and risk of gallstones before PSM

Percentage degree of weight gain,%	Adjusted Model	
	OR (95% CI)	<i>P</i> -value
< -2.453	0.954 (0.921~0.987)	0.0075
≥ -2.453	1.029 (1.011~1.047)	0.0012
Logarithmic likelihood ratio test <i>P</i> -value		< 0.001

Supplementary Table SII. Threshold effect analysis of the relationship between weight gain percentage and risk of gallstones after PSM

Percentage degree of weight gain,%	Adjusted Model	
	OR (95% CI)	<i>P</i> value
< -3.308	1.055 (1.02~1.091)	0.0019
≥ -3.308	0.971 (0.957~0.986)	< 0.001
Logarithmic likelihood ratio test <i>P</i> value		< 0.001

Supplementary Table SIII. Association between weight gain percentage and risk of gallstones

Variable	Before PSM				After PSM			
	Model 1		Model 2		Model 1		Model 2	
	OR (95% CI)	<i>P</i> -value	OR (95% CI)	<i>P</i> -value	OR (95% CI)	<i>P</i> -value	OR (95% CI)	<i>P</i> -value
Per 1% increase	1 (0.99~1)	0.332	1 (0.99~1.01)	0.647	1 (1~1.01)	0.129	1.01 (1~1.01)	0.131
Percentage degree of weight gain,%								
-5-5%	1(Ref)		1(Ref)		1(Ref)		1(Ref)	
<-10%	1.75 (1.4~2.18)	<0.001	1.87 (1.46~2.4)	<0.001	1.64 (1.24~2.18)	0.001	1.68 (1.26~2.23)	<0.001
-10--5.1%	1.1 (0.87~1.38)	0.436	1.16 (0.9~1.48)	0.249	2 (1.59~2.52)	<0.001	2.11 (1.65~2.68)	<0.001
5.1-10%	1.15 (0.9~1.46)	0.263	1.31 (1.02~1.68)	0.037	1.42 (1.06~1.9)	0.019	1.49 (1.1~2.03)	0.011
>10%	1.28 (1.02~1.61)	0.032	1.38 (1.08~1.76)	0.009	1.49 (1.13~1.97)	0.005	1.52 (1.13~2.04)	0.006
P for trend	0.94 (0.88~1.01)	0.096	0.95 (0.89~1.03)	0.231	1.06 (1~1.13)	0.062	1.07 (1~1.14)	0.06

Supplementary Table SIV. Association between MHR and risk of gallstone

Variable	Before PSM				After PSM			
	Model 1		Model 2		Model 1		Model 2	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Log2-transformed MHR	0.87 (0.78~0.97)	0.015	0.78 (0.69~0.88)	<0.001	1 (1~1.01)	0.129	1.01 (1~1.01)	0.131
MHR Quartiles								
Quartile 1	1(Ref)		1(Ref)		1(Ref)		1(Ref)	
Quartile 2	0.8 (0.64~0.99)	0.041	0.73 (0.58~0.91)	0.005	0.69 (0.57~0.85)	<0.001	0.69 (0.56~0.84)	<0.001
Quartile 3	0.78 (0.63~0.97)	0.027	0.68 (0.54~0.86)	0.001	0.7 (0.57~0.86)	0.001	0.69 (0.56~0.86)	0.001
Quartile 4	0.86 (0.69~1.07)	0.169	0.7 (0.54~0.89)	0.004	0.78 (0.63~0.95)	0.015	0.76 (0.61~0.95)	0.014
P for trend	0.96 (0.89~1.02)	0.199	0.89 (0.83~0.97)	0.004	0.93 (0.87~0.99)	0.027	0.92 (0.86~0.99)	0.027

OR = odds ratio; CI = confidence interval. Model 1 was unadjusted; Model 2 was adjusted for age, sex, race, educational level, marital status, family poverty-income ratio, smoking and drinking status, sleep duration, weight loss attempts in the past year, diabetes, hypertension, coronary heart disease, cancer, and asthma.

Supplementary Table SV. Association between weight gain percentage and MHR

Variable	Before PSM				After PSM			
	Model 1		Model 2		Model 1		Model 2	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Per 5% increase	1.51 (0.77~2.25)	<0.001	2.62 (1.9~3.33)	<0.001	1.1 (0.07~2.13)	0.037	1.93 (0.92~2.95)	<0.001
Percentage degree of weight gain,%								
-5-5%	0(Ref)		0(Ref)		0(Ref)		0(Ref)	
<-10%	0 (-0.05~0.05)	0.994	-0.04 (-0.09~0.01)	0.088	0.06 (-0.04~0.15)	0.223	0.03 (-0.06~0.12)	0.523
-10--5.1%	0 (-0.04~0.05)	0.848	-0.02 (-0.07~0.02)	0.326	0.03 (-0.05~0.11)	0.463	0.05 (-0.02~0.13)	0.17
5.1-10%	0.05 (0~0.09)	0.072	0.07 (0.03~0.12)	0.002	0 (-0.1~0.1)	0.951	0.03 (-0.07~0.12)	0.564
>10%	0.07 (0.02~0.12)	0.003	0.12 (0.08~0.17)	<0.001	0.07 (-0.02~0.17)	0.13	0.14 (0.04~0.23)	0.004
P for trend	0.02 (0.01~0.03)	0.007	0.04 (0.03~0.06)	<0.001	0.01 (-0.01~0.03)	0.383	0.03 (0.01~0.05)	0.008

B = Beta-coefficient; CI = confidence interval. Model 1 was unadjusted; Model 2 was adjusted for age, sex, race, educational level, marital status, family poverty-income ratio, smoking and drinking status, sleep duration, weight loss attempts in the past year, diabetes, hypertension, coronary heart disease, cancer, and asthma.